

STRUCTURE? PHOOEY!

"Virtual" corporations can win business without the overhead costs of traditional organizations. Page 64

JOBS YOU WANT

What are the best bets if you're job-hunting? Page 50



Sprint recruiter
Michelle Gorman

JOBS YOU NEED TO FILL

How do you find the right candidate? Try looking close to home, and ask the right questions. Pages 52, 55

COMPUTERWORLD

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SEPTEMBER 13, 1999 ■ VOL. 33 ■ NO. 37 ■ \$4 COPY

MICROSOFT USERS COOL TO 'PC PLUS'

PC dominance won't help new strategies

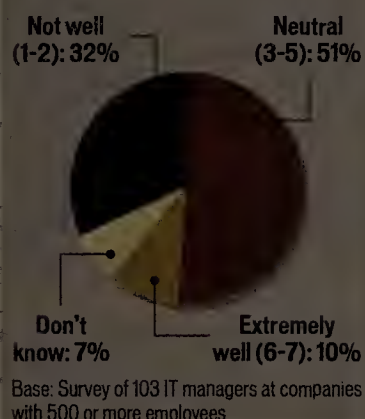
BY DAVID ORENSTEIN

Microsoft Corp. spent this summer stepping up its romance of the market for Internet appliances. Call it the summer of PC Plus. So far, though, many users don't see it as a definite plus for them.

Microsoft uses the term PC Plus to refer to devices such as handheld computers, wireless phones, TV set-top boxes and network computers. Since May, when the company announced a \$5 billion deal with

Uncharted Waters

How well does Microsoft serve the needs of non-PC-centric users? (1=not well, 7=extremely well)



AT&T Corp. to put Windows CE on millions of set tops, Microsoft has poured another \$600 million into similar ventures (see chart, page 113).

In total, Microsoft has spent *PC Plus*, page 113

IT QUESTIONS IN WAKE OF BIG MERGERS

Internet challenges top CBS, Viacom list

BY THOMAS HOFFMAN

Viacom Inc.'s \$36 billion bid last week to acquire New York-based CBS Corp. creates two significant challenges for the companies' information technology organizations: crafting an Internet strategy to cross-promote their brands while supporting a network of television stations that may require divestitures to satisfy antitrust concerns.

CBS CEO Mel Karmazin said he expects that the new Viacom "will be one of the lead-
CBS, Viacom, page 16

Layoffs, consolidation likely at hotel firms

BY STACY COLLETT

The integration of systems at Hilton Hotels Corp. and Promus Hotel Corp. — which announced a \$4 billion merger last week — should be easier than usual because both companies have the same type of core reservation system.

But system consolidations and layoffs of information technology personnel are highly likely, observers said.

The merger, to be completed by year's end, is expected to save the companies \$90 mil-
Hotel Merger, page 16

WEB SITES CRACK DOWN ON FRAUD

E-commerce sites vow to police themselves to combat image of 'the Wild, Wild Web'

BY JULIA KING

Online auctioneer eBay Inc. is officially on record as having "zero tolerance" for selling illegal items on its wildly popular Web site.

Yet that didn't stop online listings for a human kidney, various other body parts and at least three babies from making their way onto the auction site earlier this month. EBay shut down the sales after learning of the listings.

These and other incidents serve up some critical lessons for e-commerce companies.

First, "the Web is not the Wild West anymore, but it's not that far away from it either. You can't just put up an online service or store and then ignore it," said Jeremy Jaffe, vice

president of e-commerce at Liberty Financial Cos.

Second, policy statements alone pack zero punch in the online marketplace.

What's also needed, experts said, are business processes and computer systems to ensure compliance.

Boston-based Liberty had to revamp its real-world business processes to work in the online world. For example, all information the company publicizes must be compliant with regulations set by the National Association of Securities Dealers Inc. Yet at first, the process

for posting information online included no such compliance review.

One reason is that "initially, doing business on the Web was seen as a hobby, a kind of experiment," Jaffe said. Now, online posting procedures have been changed to include review by a compliance officer.

At Crossmarket.com, a Medford, Mass.-based business-to-business online auction, executives like Jayson Score have imposed on themselves the same rules and procedures that apply to real-world auctioneers as a means of protecting themselves against online fraud.

"We take fiduciary responsibility for all transactions, and
Fraud, page 113

JUST THE FACTS

Not So Fast

EBay pulled the plug on auctions of:

- Three babies
- A teen's virginity
- 200 lb. of cocaine
- Guns and ammunition

FACES OF Y2K










DISASTER RECOVERY TEAMS are huddling in Y2K war rooms. Banks are preparing customer-relations programs. Corporations and communities throughout North America are racing to meet the ultimate inflexible deadline: the rollover of computer calendars to 01/01/00 (we hope!). So *Computerworld* sent a team of photographers to spotlight the men and women who are on the Y2K front lines.

Photo essay begins on page 56.



WALTER TAYLOR of Delta Air Lines is a key player on the Y2K front lines in a critical industry

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There's only one.



THIS AIN'T COMDEX

But the annual Burning Man technology and arts festival did showcase some neat technology, including an innovative two-way satellite link to the Internet and purple lightning by a guy named Dr. Megawatt. Really. Pages 20-21

SHARK ATTACK!

You asked for more Shark Tank, our home for IT rumors, CIO pratfalls, vendor gossip and righteous outrage. We listened - the Shark has gone daily! For a fresh bite of scandal, go to www.computerworld.com/sharky. And since Sharky gets most of his material from you, we've got an irresistible lure: If your story goes in the Tank, you get the killer T-shirt shown here. Just don't wear it to the office on casual Friday, or the boss will know who ratted him out on the latest car-wreck project.



COMPUTERWORLD THIS WEEK

SEPTEMBER 13, 1999

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- 6 COURT PROTECTS** site that disclosed confidential Ford documents but adds restrictions to protect the automaker.
- 8 SUN DEBUTS** new thin-client concept, with smart card that makes apps portable.
- 10 NSAKEY** is no back door to Windows, expert argues; Microsoft calls key a concession to export rules.
- 12 MICROSOFT PONDERES** changes in temp policy, which may trigger human resources changes in other high-tech companies.
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- 36 Y2K**, easy Internet start-up money and the people shortage top John Gantz's list of IT issues. What are yours?

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- 56 FACES OF Y2K:** Photo essay pays tribute to those who have done the work to get ready for the millennium.
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- 80 EMERGING COMPANIES HANDLING LARGE** data repositories is the stock in trade of the SilkWorm switches from Brocade Communications Systems.
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- 94 QUICKSTUDY:** Tool Command Language is a great way to tie apps together, especially on the Web. We explain how it works and why it's important.
- 96 OPEN-SOURCE** software has some pretty big advantages and some significant drawbacks.

WOULD YOU LIKE TO COME TO MY TEMPLE FOR A FOOT MASSAGE?

AN ANONYMOUS YOUNG MAN (DRESSED IN A WHITE CORSET AND DRINKING ABSINTHE) TO A YOUNG WOMAN (DRESSED ONLY IN BODY PAINT) AT THE BURNING MAN TECH AND ARTS FESTIVAL, 120 MILES NORTH OF RENO, NEV., THE WEEK BEFORE LABOR DAY. THE YOUNG WOMAN TOOK UP THE GENTLEMAN'S INVITATION, AND THEY DISAPPEARED ACROSS THE BURNING DESERT. SEE STORY ON OTHER ASPECTS OF THE FESTIVAL, PAGE 20.

AT DEADLINE

Andreessen Steps Down

Web pioneer and Netscape Communications Corp. co-founder Marc Andreessen said Friday he's stepping down from his post as America Online Inc.'s chief technology officer, which he assumed in January after AOL acquired Netscape. Andreessen will become a part-time technologies adviser to AOL. He will be succeeded by William J. Raduchel, who was chief strategy officer at Sun Microsystems Inc.

Federal Systems Still Lag on Y2K

The Y2K readiness of airports and some Federal Aviation Administration information systems, along with numerous other federal systems, remains in doubt, according to the congressional committee monitoring federal year 2000 repairs. The House subcommittee on Government Management, Information and Technology said Friday that 5% of the government's mission-critical systems have not been repaired, including postal, Medicaid and immigration systems.

Short Takes

SUN MICROSYSTEMS asked the Federal District Court in San Jose to reinstate an injunction in its Java lawsuit against **MICROSOFT CORP.** An appeals court lifted the injunction last month. . . . Officials representing the nation's top stock markets, including the **NEW YORK STOCK EXCHANGE** and the **NASDAQ STOCK MARKET INC.**, said Wall Street is completely prepared to handle the year 2000 date change. . . . Chief executives from some of the world's largest companies will gather in Paris today to discuss strategies for heading off government restrictions to e-commerce. . . . The **BRAZILIAN POSTAL SERVICE** has hired **UNISYS CORP.**'s Brazilian subsidiary to integrate its branch offices in a \$55 million contract. . . . **MICROSOFT** said an outside security firm will audit its Hotmail free e-mail service after a security breach exposed users accounts to would-be intruders. Microsoft acted at the suggestion of the nonprofit online privacy monitor Truste in Palo Alto, Calif.

ERP Faces Net Server Issues

Some queries are being diverted from the back office to avoid throughput problems

BY CRAIG STEDMAN

COMPANIES hooking ERP systems to the Internet are facing a new issue: whether they should let customers directly query the back-office software — at the risk of bogging down the system — or divert them to a separate database server.

For Swiftwater, Pa.-based Pasteur Merieux Connaught USA, a maker of vaccines, the answer is to off-load the most resource-intensive queries from its SAP AG enterprise resource planning (ERP) system.

Pasteur and several customers are testing an applica-

tion that lets doctors and hospitals reach directly into the SAP R/3 back-office system to place orders and view their purchase histories. But for more detailed analysis of the buying records, the company plans to shunt the customers to a stand-alone report server.

"We don't want to use SAP as a data warehouse," said Rick Troiani, a senior programmer analyst at Pasteur. "We don't even let in-house people report off of the SAP system now."

The report server should be in place this fall, Troiani said. Reports will be generated from an existing data warehouse that gets nightly feeds of data

JUST THE FACTS

Tying ERP To the Web

Direct ERP access for external users:

Lets customers enter purchase orders via the Web and gives them an up-to-the-minute view of information, such as order status and inventory availability. But the ERP system may not be able to handle complex queries without slowing down transaction throughput.

Staging data outside the ERP system:

The information available to customers may be a day old if data only gets pulled out of the ERP applications nightly. But billing records and other historical data can be queried and analyzed without running the risk of bogging down the ERP system.

from the R/3 system. Pasteur expects to use Web application server software developed by Allaire Inc. in Cambridge, Mass., to link customers to the reporting engine, the same set-up it's using to let them enter online orders into R/3.

Giving outside users direct Web access to an ERP system to look up historical data "may work for smaller companies that don't have a huge number of customers," said David Caruso, an analyst at AMR Research Inc. in Boston.

But, like Pasteur, many large users are staging that kind of information outside their ERP applications in order to "hedge their bets," Caruso said. "There's just a lot of unknowns right now" about the possible impact on transaction throughput, he added.

Some software vendors are starting to address the issue. For example, Acta Technology Inc. in Palo Alto, Calif., this week plans to announce a package that will let users build separate caches of R/3 data for their customers to query via the Web.

Green Mountain Coffee Inc., a coffee roaster in Waterbury, Vt., hopes to avoid the need to do that sort of data staging for a new ERP-based online sales application. The e-commerce link was turned on for consumers this summer and is due to be expanded in the fall.

Customers now go directly into Green Mountain's ERP system, which is built on applications from PeopleSoft Inc. in Pleasanton, Calif. But the ERP database server "is the single throttle point that we have to stay ahead of," said Green Mountain CIO Jim Prevo. ▀

NetWare 5 Gets Clustering

Novell's services beat Microsoft to market

BY DAVID ORENSTEIN

After more than two years of struggling to bring it to market, Novell Inc. will announce clustering services for NetWare 5 at Networld/Interop '99 in Atlanta this week, observers said.

Dell Computer Corp. will be among the hardware vendors joining Novell in its announcement and has already helped the University of Idaho build a four-server cluster, said Jenny Helms, a Dell systems consultant.

The Round Rock, Texas, PC and server maker said it will certify NetWare clustering across its server line. The technology, which entered its third beta this summer, will let users connect up to eight servers in a cluster, although Novell has demonstrated 16 nodes in a lab.

Ed Sawicki, an author and managing director of the Portland (Ore.) Area NetWare Users Group, said clustering is worthwhile not only for file and print servers — NetWare's primary market — but it can also keep Novell Directory Services running on NetWare.

If the directory fails, he said, applications that depend on it could grind to a halt.

Richard Ketcham, president of the Orange County (Calif.) NetWare Users Association, said his Yorba Linda, Calif., consulting company, Data-pointe, is working with a multi-billion-dollar construction firm that is evaluating Novell's clustering services to strengthen its 600-server network.

As tough as Novell's road to market has been — the first effort dissolved into a lawsuit — the software still beats Microsoft's clustering enhancements to market by a few months, said Laura DiDio at Giga Information Group Inc. in Cambridge, Mass.

Clustering services are most frequently used for servers that host Web content, applications and data rather than file and print servers. ▀

NETWORLD/INTEROP '99

MORE ONLINE

For resources related to Novell NetWare, such as user groups, publications and books, visit our Web site.
www.computerworld.com/more

EDS Makes Services Move

Four new business units are formed

BY CRAIG STEDMAN

Electronic Data Systems Corp. last week announced the latest in a series of reorganization moves made by CEO Dick Brown, who was hired early this year to shake up the outsourcing and services firm.

The latest step organizes the Plano, Texas, company's service offerings into four business units: the flagship outsourcing business, an e-commerce and enterprise applications group, the A. T. Kearney consulting division and a newly separate business process management operation.

As part of the move, which is due to take effect next month, EDS said it also will set up new vertical-industry consulting teams and assign a single em-

ployee to manage relationships with each of its customers.

Peter Bendor-Samuel, president of Everest Group, a Dallas firm that consults with users on outsourcing deals, said change has been long overdue at EDS. It "became very bureaucratic and was really losing ground on the whole services industry," he said.

But Brown still has to do "a lot more slimming down" at EDS while trying to find a way to build up the company's non-outsourcing businesses, Bendor-Samuel added. "EDS has been and still is primarily a mainframe outsourcer."

After Brown was brought in, EDS in the spring eliminated 5,200 jobs — or about 4% of its workforce — and last month said it would offer early retirement incentives to as many as 8,000 employees. More than a half-dozen top executives have also left the company. ▀



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Instant Chat Finds Home In E-Commerce Sites

Apps seen as customer service tool; AOL client part of key deal

BY DOMINIQUE DECKMYN
AND JULIA KING

INSTANT MESSAGING has threaded its way into online business as a tool to deliver customer support and convert Web site visitors into buyers.

FaceTime Communications Inc. in Foster City, Calif., will announce this week an agreement with America Online Inc. that lets owners of e-commerce sites communicate with visitors using the popular AOL Instant Messenger client. FaceTime claims to be the first business-to-consumer tool authorized to use the AOL network. FaceTime said it is also in negotiations with Microsoft Corp. and Yahoo Inc. about connecting to their respective messaging technologies.

Several vendors, including FaceTime and Austin, Texas-based Acuity Corp. have been offering software that allows a customer to engage in a real-time text chat with a customer

Instant Solution?

In a recent survey of 125 online sites, more than half never responded to e-mailed customer service inquiries, took more than five days to reply or failed to offer an e-mail address at their site.

Only 3% of major e-commerce sites offer a live "help" button

SOURCES: JUPITER COMMUNICATIONS INC., NEW YORK; NET EFFECT SYSTEMS, NORTH HOLLYWOOD, CALIF.

service representative using a browser window. Integrating that with the increasingly popular instant messaging is an obvious next step, said Jonathan Penn, an analyst at Giga Information Group Inc. in Santa Clara, Calif. "You have to give consumers as many options as possible to contact you," said Penn.

Acuity will also announce that it is being acquired by

Quintus Corp. in Fremont, Calif., a developer of call center software.

Reno, Nev.-based iGo.com Corp., a retailer of accessories for mobile computers, uses FaceTime to have "several hundred" chat sessions with customers every day, said CEO Ken Hawk. The chat sessions have yielded a "significantly increased" rate of converting visitors to buyers, said Hawk. He said the AOL deal will make it even easier for customers to communicate directly with online businesses.

Text Chat Problems

But text chat has its drawbacks. "Text-to-text is difficult" and hasn't worked to increase the number of browser visitors who become buyers, said Keith Clougherty, CEO and founder of Roxy.com, Inc., an online consumer electronics retailer. Roxy.com answers questions in real time via both text chat and Internet-based

audio, which it integrated into Acuity's WebCenter software. Lengthy text chats can turn off users, said Clougherty.

Others worry about the additional investment in service staff.

"I'd have a hard time justifying the cost for that," said Norman Hullinger, vice president

of sales and operations at online retailer Egghead.com Inc. in Vancouver, Wash.

Bruce Mowery, vice president of marketing and business development at online health and beauty store More.com Inc. in San Francisco, is using real-time chat only in the checkout area of his Web site, where the benefits are highest. Typically, about 50% of online buyers never complete their purchase, so "if you can get that number down by 10 points, you can already see a big return on investment," said Mowery. ▀

E-Mail Response Software on Rise

To deal with the flood of customer e-mail, more companies are turning to automated response software, according to a new study from International Data Corp. (IDC) in Framingham, Mass. But users are asking vendors to integrate the software with call center programs, e-mail marketing and instant messaging applications.

E-mail response software was a \$30 million market last year and is expected to reach \$75 million this year and \$350 million in 2003, said Mark Levitt, an analyst at IDC.

"Most of the companies doing business on the Web [still] don't have such a solution in place," Levitt said. But it might well disappear as a distinct market as the integration process continues.

Jack Rodgers, president of the Consumer Direct Group at online mortgage supplier Mortgage.com Inc. in Plantation, Fla., said

Brightware Server from Brightware Inc. in Novato, Calif., generates automatic responses to about 80% of e-mail queries, dramatically cutting the workload for Mortgage.com's 300-member customer service staff. If a single vendor were to come up with an integrated product combining call center features with other forms of customer interaction, it would greatly benefit Mortgage.com, Rodgers said.

E-mail response management vendors are already moving in that direction. Last month, Kana Communications Inc. in Palo Alto, Calif., said it would acquire Connectify Inc. in nearby San Mateo, Calif., which develops e-mail marketing software.

And in May, eGain Communications Corp. acquired Sitebridge Corp., which develops real-time chat software.

— Dominique Deckmyn

Ford Suit May Be a Draw

Both sides claim victory as judge rules

BY KATHLEEN MELYMUKA

Both sides claimed victory last week as a judge granted only part of Ford Motor Co.'s request for a preliminary injunction against a Web site operator who has been publishing confidential Ford materials.

U.S. District Court Judge Nancy G. Edmunds barred Robert Lane of Dearborn, Mich., from infringing on Ford copyrights, including publishing internal Ford documents on his Web site or soliciting confidential information from Ford employees. But she denied Ford's request to enjoin Lane from using, copying or disclosing internal Ford documents on his site.

The judge noted the irony of

the huge car company being held hostage by an individual with an ax to grind.

"Technology blurs the traditional identities of David and Goliath," she wrote. Nonetheless, she concluded, "The courts have steadfastly held that the First Amendment does not permit the prior restraint of speech."

Lane's Web site declared a victory for the Constitution, while Ford claimed its rights had been upheld.

The court found that although Lane may have violated the Michigan Uniform Trade Secrets Act when he published confidential Ford documents on his site, an injunction restraining publication of Ford

trade secrets would constitute an invalid prior restraint of free speech.

Edmunds cited precedents such as the federal government's failed attempt to stop the publication of the Pentagon Papers by *The New York Times* during the Vietnam War, noting, "Ford's trade secrets... are certainly not more volatile than those at issue in the Pentagon Papers case."

However, the judge held open the possibility that Ford could press the issue when she noted that although a defendant's improper conduct in obtaining confidential information doesn't justify prior restraint, "the legal system may yet provide redress through criminal prosecution."

That's an option Ford says it plans to pursue. "We're continuing with litigation," said spokesman Jim Cain. "[Lane] has damaged our business, and we'll quantify that at trial." ▀

U.S. Open Online Sales Soar

BY THOMAS HOFFMAN
FLUSHING MEADOWS, N.Y.

Thanks in part to the U.S. Open's use of a sophisticated data mining tool, organizers have sold three times as many T-shirts, hats and other trinkets on the tennis tournament's Web site in 10 days as it did during the two-week event last year.

Some of the surge can be attributed to a 50% year-to-year increase in overall site traffic, but IBM, which is hosting the www.usopen.org site, claims that its SurfAid Web analytics

tool has helped the U.S. Tennis Association (USTA) determine that T-shirts — followed by accessories and hats — are the top-selling merchandise and deserve aggressive promotions.

"We're selling more merchandise this year than we've ever done before," said

Pierce O'Neil, marketing director for the USTA. IBM officials said the online pro shop had sold \$181,000 worth of gear through Sept. 7, up from \$60,000 during last year's U.S. Open tournament. ▀



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BRIEFS

Nuclear Y2K Cloud

Of the nation's 103 nuclear power plants, 28 haven't completed their year 2000 repair work, and two plants won't finish until late in the year, the U.S. Nuclear Regulatory Commission (NRC) said last week. But the NRC said all plant safety systems have been repaired, and the remaining Y2K work concerns nonnuclear power generation and administrative systems.

Retailer Settles Suit

Fry's Electronics Inc., a San Jose-based computer retailer, has settled a lawsuit that charges the nation's top computer retailers with failing to notify customers about the year 2000-readiness of the products they sell. Under the settlement, Fry's agreed to notify past and current customers about the Y2K-readiness of products they bought.

E-Commerce Support To Explode, Study Says

The market for software and services to support e-commerce will skyrocket from \$25 billion in 1998 to \$104 billion in 2003, according to a study by Input, an IT market research firm. The growth is attributed to integration projects that link Web sites to back-end order entry and fulfillment systems, Input said.

Billing Firms Merge

Amdocs Ltd., a St. Louis-based developer of billing and customer service applications for telecommunications companies, said it would buy International Telecommunication Data Systems Inc. (ITDS) in Stamford, Conn., for \$182 million worth of stock. ITDS prepares telephone bills on an outsourcing basis.

Novell to Port To Compaq Unix

Compaq Computer Corp. and Novell Inc. last week said Novell will port Novell Directory Services (NDS) to Compaq's Tru64 Unix operating system. Under the deal, Novell will deliver the first native 64-bit port of NDS to Tru64 Unix in the first half of next year.

Sun's Third Client Try May Be Charm

Smart card security feature, access to Windows NT, Unix and Java applications

BY STACY COLLETT
NEW YORK

SUN MICROSYSTEMS Inc. wants to make computing as easy and reliable as using any home appliance. Its new thin-client offering comes close, observers say.

The Sun Ray 1, unveiled last week, is a notebook-size unit that manages a keyboard, mouse and monitor. It relies on Sun SPARC servers running a Solaris operating environment and Sun Ray enterprise server software for all its processing power and applications, which saves time and money on upgrades and maintenance. It also runs applications from Linux, Windows NT, Unix and Java platforms. The servers are priced from \$5,000.

More intriguing is Hot Desk. Sun's smart-card technology that lets applications be directed to any desktop in the workgroup so they don't have to be reopened. A user can freeze a word processing session, for example, by unplugging the system or removing his access card. When the card is inserted into another terminal, the application reappears, with all changes intact. Users also can take presentations to meetings by carrying their smart cards and inserting them into a conference room appliances.

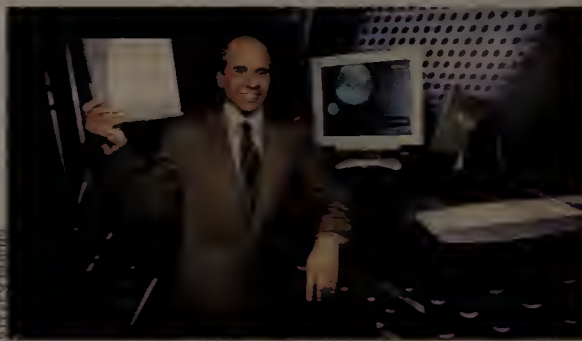
"Our goal is ubiquitous computing," said Duane Northcutt, the Sun engineer who led the project.

Sun said it plans to license Hot Desk technology to manufacturers so they will create devices enabled with smart cards.

Smart card access devices on PCs aren't new, said Andy Bochman, an analyst at Aberdeen Group Inc. in Boston. "But the idea that what you see

travels where you are is new," he added.

Bank of Nova Scotia in Toronto has been using 50 Sun Rays to run both NT- and Unix-based applications since March, eliminating the need for two PCs and monitors on workers' desks. Senior Vice President Gail Smith said he



SUN PRESIDENT ED ZANDER says the company has learned from past thin-client efforts

has found the Sun Rays' performance to be "as good, if not better than" that of the PCs. He added that he plans to replace most of the company's 350 PCs with Sun Rays.

Sun Ray appliances can be leased for \$9.99 per month or purchased for \$499. Monitors are sold separately and usually cost several hundred dollars.

James Pennington, a vice president at Charlotte, N.C.-based The LearningStation.com, which provides applica-

tions to schools via the Web, has also tested the Sun Ray. He said he found the cost of a complete system to be about \$700.

For \$30 per month, users can lease the

JUST THE FACTS

Sun Ray Features

- Plug and Play
- Session mobility through Hot Desk smart card
- Centralized operating system
- Full multimedia features standard
- Runs applications on Java, Linux, Windows NT and Solaris
- Price: \$9.99/month to lease; \$499 to own (monitor not included)

SOURCE: SUN MICROSYSTEMS INC.
PALO ALTO, CALIF.

appliance, plus a Sun Enterprise workgroup server, monitor, Ethernet switch, Sun Ray server software and Sun's new StarOffice productivity suite (which can be downloaded free from the Internet).

This is Sun's third try at a thin-client offering. Previous JavaStations failed to catch on because they supported only a few applications.

"We've learned a lot over the last two years," said Ed Zander, Sun's president and chief operating officer. "Today's technology is anything but what we've seen in the past." ■

Voice Over IP Heads Network/Interop List

Gigabit Ethernet, net tools also on tap

BY SAMI LAIS

An expected crowd of more than 50,000 at Network/Interop '99 in Atlanta this week will hear the major chords of the future — voice, data and video over IP, managing networks to meet business goals, Gigabit Ethernet over copper and high-touch routers.

Virtual Private Networks "are a hot topic for us as a way for our clients to securely get into our network," said David Lembke, network services manager at Investors Fiduciary Trust Co. in Kansas City, Mo. The company plans next year to go to Gigabit Ethernet over copper for its LAN backbone.

As in years past, users such as Lembke are interested in voice over IP, but aren't yet ready to make the leap. "It's neat, but we have a lot invested in our Lucent [Technologies

Inc.] network," he said.

But what users will be calling for is interoperability and ease of use, industry analysts predicted.

"I think we'll see a lot of fast-discovery, easy-to-use, drop-in solutions," said Richard Ptak, an analyst at Hurwitz Group Inc. in Framingham, Mass.

One package that could fall into that category is OpenRiver 2.2, which Riversoft Inc. in New York bills as an interventionless network management product. An installation wizard walks users through installation while it autodiscovers the network, Riversoft said. Version 2.2 will ship Nov. 1 and cost \$6,000 for a 25-device departmental network.

Users will see Computer Associates International Inc.'s NetWorkIT 2.0 in action, running the network for Network/Interop. Announced today, the new version of the stand-alone network management software replaces NetWorkIT 1.0 and NetWorkIT

Pro. It runs on HP-UX, Solaris and Windows NT.

CA is also filling the help desk slot for the show network with its Unicenter TNG Help Desk 4.0. "The integration between the two was very compelling for us," said Steve Wylie, network operations manager at Network/Interop. "Part of their pitch was we don't need rocket scientists to set it up," he said.

Under wraps until later this week is an announcement on network security from Intel Corp. along with Compaq Computer Corp., Entrust Technologies Inc., IBM and Microsoft Corp.

And Cisco Systems Inc. will unveil a new initiative on convergence — voice over IP, data and video — and the corporate enterprise.

The company will also show its Service Level Management Suite, an extension to Cisco-Works2000. The product is set to ship early next year and will cost about \$15,000. ■

MOREONLINE

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www.computerworld.com/more

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Microsoft, Expert Dispute Claims About Windows Security

BY ANN HARRISON

An independent security expert has questioned allegations made earlier this month that

the National Security Agency has a back door to Microsoft Corp.'s Windows platform. Microsoft also denies the charge.

Andrew Fernandes, chief scientist at Cryptonym Corp., a Mississauga, Ontario-based security software company, said

one of two keys Microsoft uses to digitally sign cryptography suites that secure data is called "NSAKEY" in the code. This

led to suspicions that the NSA had the ability to sign cryptography suites or insert a "Trojan horse" — both of which could compromise encrypted data on Windows 95, 98, 2000 and NT systems.

But cryptographer Bruce Schneier, president of Counterpane Systems, a Minneapolis-based cryptography and security consultancy, noted that if the NSA wanted to compromise Microsoft's CryptoAPI, which supports the encryption of data in Windows programs, it would be easier for it to persuade the company to divulge its signature key or install an NSA-compromised security module.

Schneier also pointed out that the NSA doesn't necessarily need a key to compromise security in Windows because programs like Back Orifice can do that to most systems without keys. Back Orifice is a Trojan horse that allows attackers to access Windows PCs remotely.

Perhaps the biggest tip-off to skeptics was the name of the key itself. If the NSA did have a secret key, naming it NSAKEY would seem too obvious. Though companies that don't release their source code for review, such as Microsoft, are always under suspicion that they could be hiding back doors in their products, anyone with a debugger could have found the NSAKEY name, Schneier observed.

Microsoft's security product manager, Scott Culp, denied that the NSAKEY key is actually shared with the National Security Agency and asserted that the company has no back doors in any of its products.

Culp said the NSAKEY key is a backup to its primary digital-signature key used to enforce encryption export regulations. Current U.S. law limits exportable software products to 56-bit cryptography without a waiver. Culp noted that export licenses are granted by the U.S. Department of Commerce, but the technical compliance review is conducted by the NSA — hence the key name. "It's safe to assume that we will change the name of that variable," said Culp.

Fernandes, though, disputed Culp's explanation and suggested that Microsoft make public the NSA's review of export requirements that the key supports. ▀

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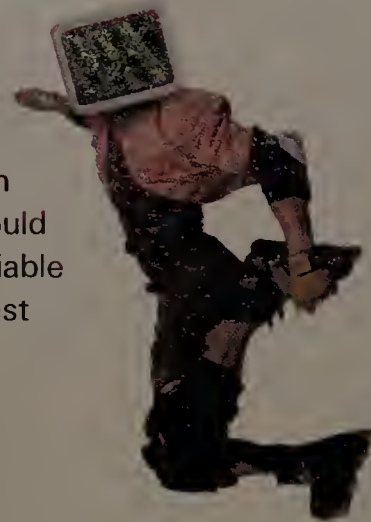
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Linux Quietly Makes Its Way Into Federal Government

Large agencies are eyeing broader uses

PATRICK THIBODEAU
WASHINGTON

Linux is quietly slipping in the back door of the federal government, in the hands of people such as William Oliver, a forensic pathologist and systems administrator at the U.S. Armed Forces Institute of Pathology.

Oliver is using the Linux operating system on workstations for imaging research, and now plans to replace some Windows NT workstations with Linux. The availability of office applications for Linux is making that switch possible.

But Oliver also hopes that by shifting to a relatively homogenous envi-

ronment — Unix and the Unix-like Linux — he will reduce systems administration costs.

"I don't have anything against Microsoft, actually," Oliver said. "To me it's almost entirely a matter of system admin overhead."

Linux is making some significant inroads at the federal government, according to federal users who gathered for the first-ever "Linux University" here last week. But it's hard to get a handle on the extent of its use. Linux is arriving stealth-like, because someone loaded it on a workstation or made a relatively small purchase.

Judging from the more than 700 federal information technology employees and systems integrators in attendance, interest is running high. The program was sponsored by Silicon Graphics Inc.

Linux is primarily being used in government research laboratories, while Microsoft Corp.'s Windows operating system dominates the vast federal bureaucracy.

But Przemek Klosowski, a

physicist at the National Institute of Standards and Technology and head of the D.C. Linux Users Group, argued that the government has an obligation to look beyond Windows and consider extensive use of alternative operating systems. "The government should be vendor-neutral," he said.

Large federal contracts often specify certain operating systems, which can make it hard for Linux vendors to get in the

front door. But federal agencies are nonetheless eyeing alternatives.

"I would welcome the ability to have a choice," said Omar Herran, a section chief in the information management division at the U.S. Department of Justice, the agency that has charged Microsoft with antitrust violations.

The Justice Department is a large user of Ottawa-based Corel Corp.'s WordPerfect software, which supports Linux. But Herran said there are several issues to address before the agency could consider deploying Linux, such as having the staff to administer it. But "what I see is encouraging," he said. ▀

JUST THE FACTS

The Linux Stealth

- Federal use of the Linux operating system is primarily limited to research
- Windows dominates the desktop, but IT officials at large agencies are eyeing its potential for wider deployment
- The spread of Linux is due to grassroots adoption by IT professionals and researchers

Bye-Bye, Temps?

Internal memos show Microsoft may alter worker policy; company denies it

BY STEWART DECK

ALTHOUGH recent internal Microsoft Corp. memos appear to show that the company is planning to change the way it uses long-term temporary workers, company officials say hiring policies haven't changed.

But according to industry observers, if Microsoft does change the way it employs "perma-temps," that will send a message to the high-tech industry about how to deal with temporary workers.

The memos — copies of which were provided to Seattle-based WashTech, an organization that represents temporary and permanent high-tech employees — appear to show that Microsoft plans to implement "workforce planning" changes. These changes would convert a large number of current positions filled by long-term temporary workers to full-time company jobs. The workers who have filled those positions would be required to interview for them like all other candidates.

Although Microsoft lost a court case in May over the status of long-term temporary workers (see chart), none of the memos specifically points to that as a reason for any of the proposed changes.

But Dan Leach, a Microsoft spokesman, said the company has neither changed its hiring policies nor has any "new policy to announce." Leach added that in product life cycles, "there's always an ebb and flow of contingent assignments ... and with Windows 2000 nearing its ship date, we expect some positions will shift."

Over the past three years, courts have determined that some long-term contractors are eligible for company retirement benefits and employee stock options. Courts are still working out the details of perma-temps' stock ownership.

Barbara Judd, a business analyst temporary worker with a

two-year contract at Microsoft, said she would welcome the opportunity to interview for a full-time job. "I'm hoping, though, that they won't use this to discriminate against some of us who have been [Communications Workers of America] union activists," Judd said.

"What [Microsoft] is publicly saying appears to be different from what they're doing," said Marcus Courtney, an organizer at WashTech. "They're moving in the right direction, but the way they're treating their contractors as external candidates ... is creating an unfair process," he said.

Barbara Gomolski, an analyst at Eden Prairie, Minn.-based Gartner Institute, said Microsoft officials would be unlikely to acknowledge any employment policy changes with parts of lawsuits still open. ▀

Microsoft Vs. Temps

October 1996 Federal appeals court rules that some Microsoft temps are eligible for Microsoft retirement benefits

July 1998 U.S. District Court rules that workers employed as independent contractors and subsequently forced to work through temporary agencies were common-law employees of Microsoft while working at the company between 1987 and 1990

May 1999 The 9th Circuit Court of Appeals rules some long-term Microsoft workers should be entitled to buy discounted Microsoft stock — Microsoft asks for rehearing

June 1999 Microsoft's appeal for rehearing denied

September 1999 Microsoft memos appear to indicate a shift in temp hiring policies

Toshiba Unwraps Celeron PC for \$549

IT likes price but may need more power

BY MATT HAMBLIN

Toshiba America Information Systems Inc. pushed further into desktop PC territory last week by announcing a low-cost Celeron machine starting at \$549. A 15-in. Toshiba monitor would add \$159 to the machine, which has a 366-MHz processor.

Toshiba, the laptop computer leader, only launched a desk-

top line 18 months ago and has ranked 11th or higher in desktop market share in recent quarters, analysts said.

Celeron-based machines from several vendors have attracted some interest by information technology managers seeking low-cost desktops that might function as thin clients or low-cost upgrades [News, May 3, June 7].

A comparable machine from Dell Computer Corp. in Round Rock, Texas, listed last week at \$699, said Joe Ferlazzo, an analyst at Technology Busi-

ness Research Inc. in Hampton, N.H.

Prashant Cherukuri, director of IS at Technion Communications Corp., a call center service in Fort Lauderdale, Fla., has recently been comparing Toshiba desktops with Dells to supply 500 PCs to a call center in development.

Cherukuri has received almost matching bids in the \$970 range, including monitors, for 400-MHz, Pentium II-based machines from Dell and Toshiba, he said. Pentium II is being phased out by Intel

Corp. but is still available.

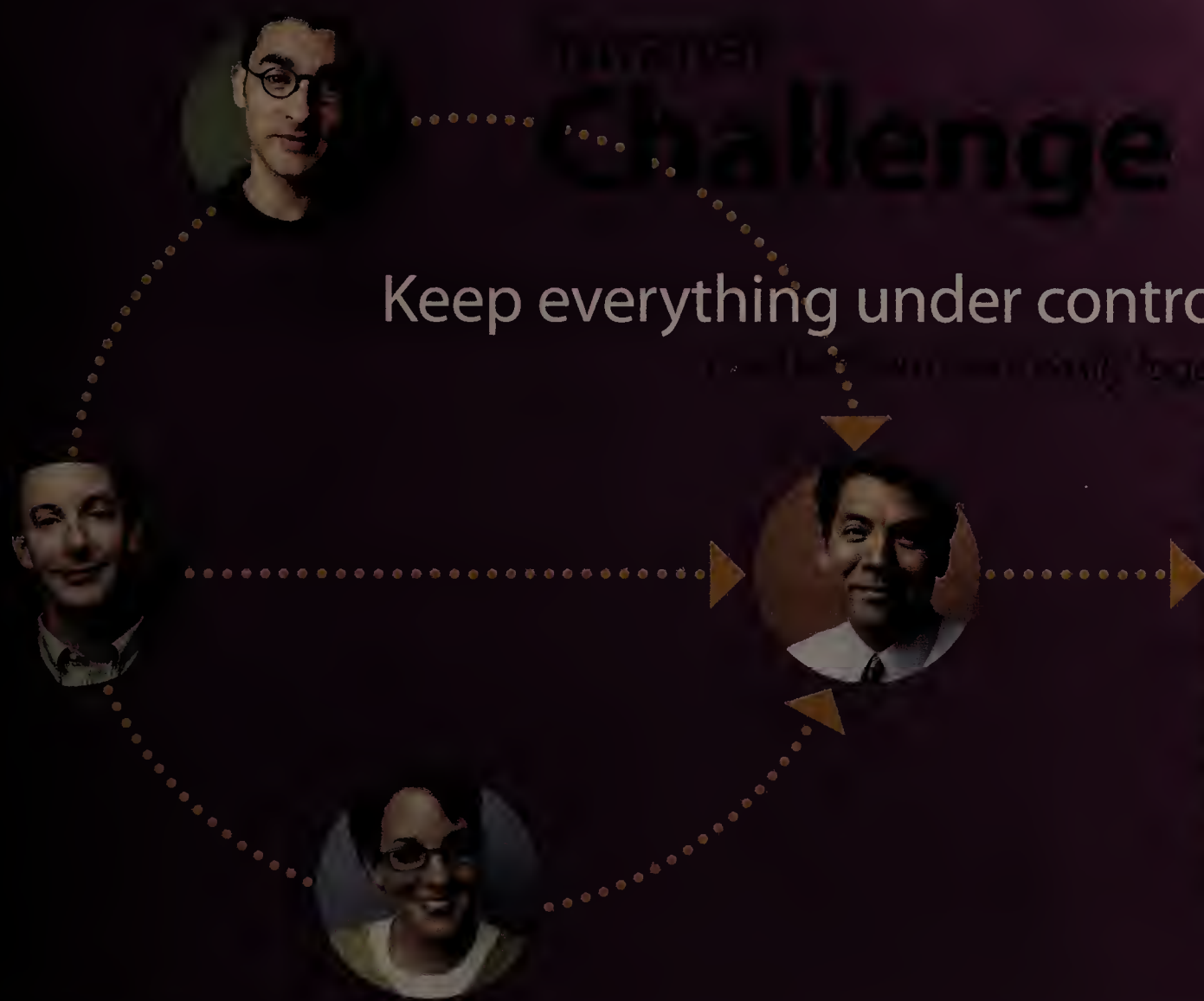
Celeron is advertised as a low-cost alternative to Pentium II and III. But during tests, Cherukuri found that when call center agents had several desktop applications running on the Celeron machines, opening another application could take several seconds longer than with the Pentium II machines, he said. "In the call center business, if it takes a couple seconds for an agent to get something, a customer might hang up," he said.

But Cherukuri said the Toshiba sales agent has been more responsive than Dell's agent and has offered to buy back existing machines. ▀

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BRIEFS

Works.com Inks Deals

Austin, Texas-based Works.com Inc., which sells office supplies online and manages procurement processes for companies over the Web, will announce an agreement this week with Fargo, N.D.-based Great Plains Software Inc. that will integrate its Extensible Markup Language documents into Great Plains' back-end accounting package.

The e-commerce concern will also get a boost when New York-based Merrill Lynch & Co. announces this week that it's making Works.com available through its www.merrillebusiness.com site.

A Market Gamble

Go Bet in Los Angeles has launched BetAtWallStreet.com, where subscribers can wager on the stock market as well as receive real-time stock quotes, business news and financial data. Members can place orders on all things bearish and bullish, such as how many shares a company might trade in a day, at what level the Dow Jones industrial average will close and how initial public offerings will do.

Cellular Fraud Losses

Cellular/personal communications services carriers lost \$33.4 million to fraud in the U.S. alone last year. International Data Corp. in Framingham, Mass., estimates the figure will grow to \$57 million by 2003 because carriers require less personal information to initiate service in their rush to sign up subscribers, making subscription fraud easier.

Short Takes

Last week, analysts at ILLUMINATA INC. in Nashua, N.H., predicted IBM will make a mass-storage agreement with Hopkinton, Mass.-based EMC CORP. They said it will be similar to the network technology agreement IBM made with Cisco Systems Inc., giving up hardware sales for service revenue. . . . New York-based ACON PRODUCTS INC. will outsource its U.S. payroll operations to Pleasanton, Calif.-based PROBUSNET SERVICES INC., which will consolidate Avon's weekly and biweekly payrolls in seven geographic regions into a nationwide check-producing operation.

Quelling Public's Y2K Fear a Top Concern

Public and private sectors move to educate, prevent hoarding

PATRICK THIBODEAU
WASHINGTON

EDUCATING the public about the year 2000 problem is becoming a priority for some government agencies and companies, which are worried that panic could trigger massive bank withdrawals and the hoarding of food and prescription drugs.

U.S. Sen. Christopher Dodd (D-Conn.), vice chairman of the Senate Special Committee on the Year 2000 Technology Problem, warned last week that the consequences of public panic may cause more harm than any Y2K computer failure.

"The greatest fear that I have is that you are going to get panic setting in . . . from those who predict dire consequences," Dodd said.

For corporate information technology managers, public panic could cause supply-chain and inventory problems, as well as overloaded call centers and telephone networks.

Panic "is one of my biggest fears," said Chris Apgar, Y2K project manager at Beaverton,

Ore.-based Providence Health Plans, which has some 670,000 members.

But Apgar, who has appeared on local television and radio talk shows to discuss Y2K, said he's seeing more community awareness projects. Avoiding a panic will take "good, sound communication on what's realistic and what's reasonable," he said.

Giant Food Inc., a Landover, Md.-based chain of 178 grocery stores, is also trying to get the message out that it's ready. The company has printed a brochure for its customers and is planning to run newspaper advertisements and meet with local media representatives and elected officials. "We've been working on this issue since 1996. We're as ready as ever," said Barry Scher, a company spokesman.

But more needs to be done, said Mike Jacob, chief consultant to the California Assembly's Information Technology Committee. Local utilities have spent more than \$1 billion fixing the problem but haven't spent enough money explain-

ing "why you don't have to go out and buy generators," he said.

California state officials plan to spend some \$2 million on public education efforts, according to Jacob.

Companies and government agencies were also warned last week to prepare for attacks

from hackers and terrorists who may try to use Y2K to mask their activities.

"Those who wish us ill will for one reason or another [will use Y2K] as an opportunity to attack," said Sen. Robert Bennett (R-Utah), chairman of the Senate Y2K committee.

Meanwhile, the California State Senate last week approved legislation that, among other things, would allow the state data centers to isolate themselves from other networks on New Year's Eve into New Year's Day to avoid virus infection. ■

Much Ado About 9/9/99

Computers around the globe hummed right along on Sept. 9, despite dire predictions that older mainframe systems and some Unix machines might interpret the date 9/9/99 as an instruction to stop processing or run programs indefinitely.

Still, experts warned that passing through the Sept. 9 interval smoothly doesn't necessarily mean that corporate computers won't experience any problems on Jan. 1.

Although some computers may have interpreted 9/9/99 as an instruction to exit a program, some systems may read 01/01/00 as Jan. 1, 1900, which could potentially confuse billing, payment and interest-sensitive systems.

A half-dozen Fortune 500 companies, including Kmart Corp. and Merrill Lynch & Co., told *Computerworld*

they experienced no problems.

"This is a complete nonevent" for Sears, Roebuck and Co., according to Jan Drummond, a spokeswoman at the Hoffman Estates, Ill.-based retailer.

Some organizations that tested against the Sept. 9 date also reported smooth sailing. "We've been conducting tests in our global operations

centers in the Far East and Europe and have no problems to report," said John Burns, vice president of projects at Canadian Imperial Bank of Commerce in Toronto.

The North American Electric Reliability Council tested against the date on Sept. 8 and Sept. 9 between power companies in the U.S. and Canada and experienced no hiccups. J. C. Penney Co. in Dallas also tested 9/9/99, as it has tested against other dates, and found no problems, said Shirley White, manager of the retailer's year 2000 coordination group.

— Thomas Hoffman and Kathleen Ohlson

CANADIAN IMPERIAL BANK has "no problems to report," says Vice President John Burns

HP Inks E-Services Deals

Builds on effort to be one-stop Net shop

BY JAIKUMAR VIJAYAN
MIAMI

Hewlett-Packard Co.'s partnerships with two application service providers, announced last week, build upon the company's recasting of itself as a one-stop provider of Internet infrastructure and services.

As a result of deals with

messaging company USA.Net Inc. and EOnline Inc., a host service for enterprise resource planning applications, users can expect to see a slew of hosted Internet applications, vertical portal sites and application integration technologies from HP over the next few months, said executives at the E-services World Executive Conference here.

Under the deal with Colorado Springs-based USA.Net, for instance, HP will make

USA.Net's commercial e-mail outsourcing services available. As part of a five-year agreement, HP will invest \$15 million in hardware and support services in return for an equity stake and a share of future service revenue from USA.Net.

With the EOnline partnership, another revenue-sharing deal, HP will sell and support rented SAP AG applications like R/3 for small and midsize businesses. EOnline is a Cupertino, Calif.-based provider of hosted SAP applications.

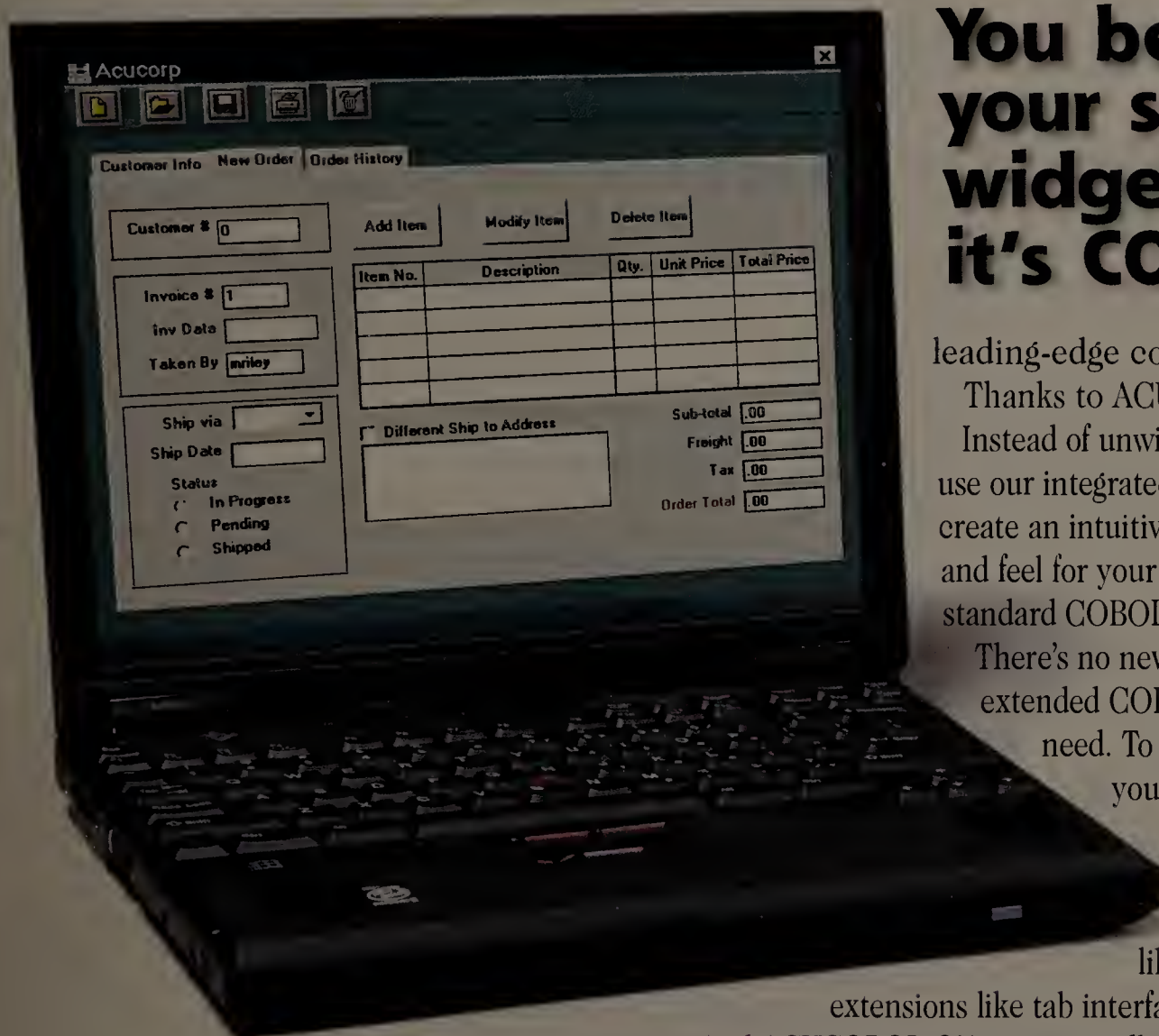
Separately, HP announced a partnership with StarMedia Network Inc., a provider of Net

services to Latin America. As part of the relationship, HP and StarMedia will offer Web hosting services — including storefronts and e-commerce transaction capabilities — to small and midsize businesses in Latin America.

The deals show HP's Internet services practice has gelled, said Richard D. Wright, chairman and CEO of Covation.com in Brentwood, Tenn., an application services provider for health care providers.

"In the last six months, HP has given concise articulation of their strategy. They're right on the money," Wright said. ■

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Business Web Sites Adding Careers Info

Job advice, research latest 'sticky' content

BY STEWART DECK

MANAGERS of business Web sites — eager to draw more visitors and keep them on-site longer — are

trying a new ploy: They're adding a mother lode of job-hunting information and career advice for browsers to explore.

The Hoover's Online (www.hoovers.com) business research resource operated by

Hoover's Inc. in Austin, Texas, will formally unveil its newly revamped site this week with a full-blown careers channel. It will have numerous career content links, including a job bank powered by the extensive Monster.com employment listings, tools for researching potential employers and the inside scoop on what it's like to

work for companies (provided by Vault.com Inc.).

The goal is to bring in more visitors and get them to stick around for a while, said Gordon Anderson, editor in chief at Hoover's Online in Austin. "Hoover's has been a single-mission site; people would come here to look up single pieces of information and then leave. Our goal is to turn this into a one-stop shop for job hunters and a top-of-the-mind resource," he said.

Customization

In the next several weeks, Hoover's will let visitors customize news and search para-

meters, so that on return visits, they can quickly see new listings that match their interests.

Career information is one of the most fashionable types of "sticky" content for keeping Web site visitors from surfing away, said Charlene Li, an analyst at Forrester Research Inc. in Cambridge, Mass. "And these aren't just job boards that sites are linking to," Li added. "It's about career management and development and continuing education."

Plenty of other sites have jumped into the careers game lately, including Manpower Inc., Realtor.com, Macmillan Publishing Ltd. and Telezoo.com. ▀

Continued from page 1

CBS, Viacom

ing" media companies on the Internet, though he didn't disclose how the company expects to get there.

IT leadership also needs to be settled. Viacom Senior Vice President Tom Esteland and CBS MIS Vice President John Lalli are now in top spots at their companies. A spokesman for Viacom in New York said it was too early to "talk about IS merger strategies."

Still, it's clear that Viacom and CBS have taken completely different approaches to their Web businesses.

Though CBS has elected to promote its Internet partners such as San Francisco-based MarketWatch.com Inc. and New York-based Medscape Inc. (www.medscape.com) in exchange for equity stakes in those companies, Viacom has instead "bought out partners outright," said Aram Sinnreich, an analyst at Jupiter Communications LLC in New York. Sinnreich pointed to Viacom's acquisition of Englewood, Colo.-based Liberty Media Corp.'s music sites, which it has since folded into MTV Networks' Web site (www.mtv.com).

Though neither company has done much to link its various sites, the prospect for Viacom (which owns New York-based MTV Networks and Hollywood-based Paramount Pictures Corp.) and CBS to cross-pollinate their marketing efforts "is a big prospect for them going forward," said Michael A. Kupinski, a media

analyst at A.G. Edwards & Sons Inc. in St. Louis.

Sharing customer data and melding data warehousing capabilities presents Viacom and CBS IT staffs with additional challenges and opportunities. Although she said she doesn't foresee any technical hurdles to sharing customer data, Robin Flynn, an analyst at Paul Kagan Associates Inc. in Carmel, Calif., said she believes that there could be some cultural "limitations" among the types of products that both Viacom's under-24 MTV audience and CBS's older viewers would share an interest in.

Though CBS and Viacom may generate cost savings by consolidating some redundant corporate operations — such as accounting and general ledger activities — their respective business units will most likely be run au-

tonomously with stand-alone information systems, said Art Bassin, president and CEO of TV Data Technologies LP, a Glens Falls, N.Y.-based provider of television programming information to newspapers, syndicators and ratings agencies.

And though Kupinski said he is bullish on the deal in the long term, he said the companies may face "some short-term execution risks," including a strong likelihood that the Federal Communications Commission will require Viacom to sell off some TV stations. Stations owned by a combined Viacom-CBS would reach roughly 41% of the U.S. market, while federal law limits TV networks from owning stations that reach more than 35%.

If Viacom is required to sell properties in markets where it would have overlapping stations, such as Boston, Philadelphia and Miami, it could create some headaches for its IT staff. The efficiencies that a company like Viacom can achieve in centralizing IT operations among TV stations in different markets "can work to your detriment during a divestiture," said Eileen Birge, an analyst at The Concours Group, an

IT management consultancy in Kingwood, Texas.

Plus, divestitures in general "can be a drain on your IT staff," said Birge, especially when the seller agrees to provide IT services to the unit being sold for a transitional period.

That can be distracting to IT employees who are busy trying to integrate the newly acquired organization, in addition to providing services to a business unit "that no longer matters to them," said Birge.

Meanwhile, CIOs must also concern themselves with how a divestiture will affect existing software and hardware licenses that are frequently priced based on monthly usage, said John Santos, an analyst at Meta Group Inc. in Frankfurt. ▀



CBS CEO MEL KARMAZIN: The new Viacom "will be one of the leading" media companies on the Internet

Continued from page 1

Hotel Merger

lion annually by combining operations, including IT functions, officials said.

"They'll be trying to move to one integrated [technology] platform that makes reservation cross-selling and data capturing easier," said Tom Storey, executive vice president of strategic planning at Promus in Memphis.

Storey said Hilton and Promus both use central reservation software called RezSolutions from Phoenix-based Anasazi Inc. Each company then builds its own applica-

tions on top of the software to suit its needs.

Reservation systems are typically connected to property management systems that monitor each hotel's bookings, as well as group sales, catering and credit-card settlements. Hilton, in Beverly Hills, Calif., uses a homegrown property management system called HPMS, a Hilton spokeswoman said, whereas Promus has connected its reservation system to a homegrown, Windows-based application called System 21.

Nearly 80% of Promus hotels use System 21, and the rest will go live in the first quarter of 2000. "That's unlikely to change," Storey said.

But consolidation of data

centers and transaction-processing functions is on the horizon, Storey said. There will also be consolidation of enterprise resource planning systems for human resources and finance. Hilton uses PeopleSoft Inc. applications for finance and human resources while Promus uses applications from Infinium Software Inc. in Hyannis, Mass.

Officials wouldn't comment on whether IT jobs would be lost, but industry observers said layoffs are likely.

"As they centralize their reservation systems, you only need one central technology group, so there's inevitably a lot of layoffs," said Larry Chervenak, president at Chervenak,

Keane & Associates, a hotel technology consulting firm in New York.

Chervenak said his firm received dozens of résumés from Promus and Hilton IT staffers just before the merger announcement.

Though the road may be paved for merging the systems, observers are split on exactly how long it will take. "It should take no longer than three to four months for the integration of the programs," said Les Spielman, an analyst at Hospitality Automation Consultants Ltd. in Valley Village, Calif.

"It's probably going to be closer to two years before they get the full benefits [of integration]," Chervenak said. ▀

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Forget Dilbert; Today, I'm Dr. Megavolt

Burning Man arts festival gives techies a chance to spoof, and test, new technology

BY ANN HARRISON

IN HER DAY JOB, Lissa Shoun is a Web page designer from San Jose. But at the Burning Man festival during the week before Labor Day, she ran an airstrip serving the more than 23,000 artists, pyrotechnic enthusiasts and technological visionaries who gathered in the desert 120 miles north of Reno, Nev.

Shoun, who last year helped

design the festival's Web site (www.burningman.com), this year ran a 5,000-ft. airstrip used by more than 40 planes that came from as far away as Denver.

Flying in on her own Grumman Tiger, Shoun spent most of the week fielding airport radio traffic and conducting aerial tours for filmmakers and photographers seeking shots of the encampment, known as Black Rock City.

The city, composed of theme

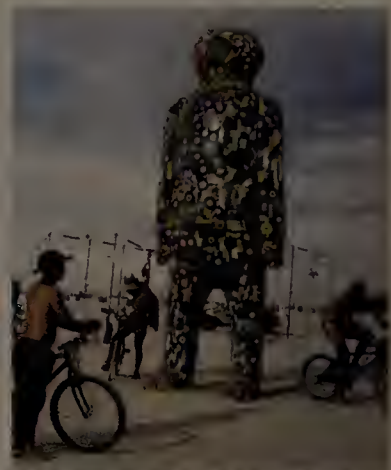
camps, was constructed to resemble a giant clock in a 2-mile arc around the Burning Man sculpture, which was located at the center of the camp's Wheel of Time.

"There are a lot of patterns visible from the air that are not immediately obvious from the ground, and there is a lot of high-tech stuff from San Francisco," said Shoun, one of many Burning Man participants who use technical skills from their jobs in the computer industry to help create this annual desert art camp.

Among the art creations was a mobile Tesla coil that emit-

ted large bolts of purple lightning and featured a performer who called himself Dr. Megavolt. Another nightly event featured "Illumination of the Tetrahedron," a 3-D light sculpture composed of green lasers that swept the desert in 10-mile beams. Atop one of many recreational vehicles scattered among the art camps, laser operator Alex Selemenev leaned down and casually lit a cigarette off one of the 5W solid-state lasers.

Flamboyant space-age costuming, body painting and casual nudity were abundant on the playa, as was a fleet of high-



BURNING MAN '99 featured a lot of electroluminescent wire and mysterious glowing sculptures

ly decorated art cars. A full-scale opera production by Pepe Ozan of San Francisco featured a towering fire lingam set that was later torched. Saturday night, the crowd gathered to witness the stirring climax of the event, the burning of the 52-ft.-tall sculpture of a man, which was preceded by a succession of daring fire dancers.

Elsewhere on the desert sand, curious campers gathered around a fiery automated tetherball sculpture called "The Chaotic," created by computer pioneer Larry Breed. Another popular sculpture featured the bow and conning tower of a full-size submarine. An Atari camp shipped in several of the machines popular among enthusiasts of classic computer games.

Among the many pyrotechnic displays were fire-breathing robot monsters created by San Francisco-based Survival Research Laboratories and the Seemen robot/kinetic art collaborative, which burned down mock-up commercial buildings to the delight of the crowd.

One tongue-in-cheek entrepreneur, who called himself Rico Thunder (and who in real life is a Web site manager for an Internet start-up in Santa Cruz, Calif.), created a theme camp called the Costco Soul-mate Trading Outlet.

The camp, which had no connection to the company of similar name, encouraged visitors to have their pictures taken and to fill out application forms created on the camp's PC. The applications were matched for compatibility, and more than 3,000 participants were directed to someone who could be Mr. or Ms. Right.

Thunder insisted the service was effective and said he



AUSTIN RICHARDS, a.k.a. Dr. Megavolt, models his special lightning-proof suit

knows of one couple introduced last year that still corresponds every day via e-mail. Although he had no interest in logging on during festivities, he said he had taken steps to block inquiries from the real Costco Wholesale Corp., a Kirkland, Wash.-based retailer that had sought to shut his site down. "Trying to control the Internet is like herding cats," Thunder said. "We are well protected by parody."

Lounging in their theme camp, the staff of the *Black Rock Gazette*, an 11,000-circulation daily newspaper published at the camp, took a rest from documenting the spectacle.

"The use of the Internet is integral to Burning Man," noted newspaper staffer Zac Bolan, a Canadian from Calgary, Alberta, who created a rink where his compatriots played desert hockey on the dry, packed earth. "We are a digital community. We are ethereal 52 weeks of the year."

Vicki Olds, publisher of the *Gazette* and owner of Reflex Graphics in San Francisco, finished her martini and gave credit to her information technology staff, who set up the four 24-hour text entry PCs and 17-in. layout monitors to publish the paper, which was sent via satellite uplink to a Kinko's in Reno for printing.

"These guys are great. They are the New Age cyber range riders," said Olds. ▀



THIS YEAR'S MAN didn't simply burn, but exploded with a full complement of fireworks and bottle rockets

L2K MAGIC BY 'THE WIZARD'



The L2K sculpture, a 500-ft.-wide circle of lights, flashed in mysterious patterns around The Man. Created by Tim "The Wizard" Black, the 2,000 LEDs were assembled by a group from Silicon Valley. The lights were wired into a harness with eight golf-cart batteries and 200 microprocessors designed by Black. Another 200 circuit boards were arranged around the Pattern Buffer Lounge camp, one of hundreds of Burning Man "theme camps." The boards flashed in sync with the circle of lights. Attendees could influence the light patterns around The Man by hitting buttons mounted on the boards. One of the Burning Man radio stations, WL2K, synchronized the pattern of lights around The Man with music. "Here we have used the technology that might be used for 200 telephones to redefine the entire physical space," Black told the *Black Rock Gazette*, one of Burning Man's two daily newspapers.

Desert Art Camp Tests New Internet Link

Besides nudists, lasers and fire dancers, the Burning Man Festival boasted the first trial-by-fire of a two-way satellite Internet link that could revolutionize how some businesses connect to the Internet.

Despite the remote location, revelers at the site, known as Black Rock City, were able to communicate with the rest of the world, thanks to a T1 satellite Internet connection provided by San Diego start-up Tachyon Inc. (www.tachyon.net).

Tachyon, which was founded in 1997, dispatched an RV full of technicians to the festival, where they set up an Internet link using a two-way satellite system called a Tachyon Access Point. The signal is beamed to an orbiting geosynchronous satellite and then back down to a gateway site at the company's headquarters. From there it is shot over to Concentric Network Corp., a San Jose-based tier one Internet service provider.

The Tachyon system's advantage is that it sends signals directly from the user site to the satellite via an on-site dish, whereas other systems are hybrid consumer-targeted operations where information is received from the satellite but goes out via landlines.

Tachyon sales engineer Gary Echo said satellite links are a more convenient and faster way for new businesses to establish Internet connectivity. "It can be four to five months to get a landline installed, and some businesses can't wait four to five months for the slow grind of the phone company to install them," said Echo.

He said the company, which received \$30 million in venture capital funding in January, will formally launch its satellite connectivity product next month, targeting top-tier Internet service providers. Tachyon will market exclusively to Internet providers in Europe and North America and expand worldwide by the end of 2001, Echo explained.

The cost of connection time will

depend on bandwidth and the Internet provider's pricing structure, Echo said. But many Internet providers are eager to expand their services to offer satellite connectivity, said Mike Liebhold, senior vice president of business development at Tachyon.

According to Echo, the Burning Man installation presented a fine opportunity to test the system in a demanding environment.

It was, in fact, the first broadband video-satellite uplink using the system. Echo's team, together with volunteer engineers John Gilmore and Clif Cox, set up a wireless Ethernet connection at Black Rock City to link the site with ITVnet Inc., a Webcasting company based in Los Angeles. The broadband video required special configuration for IP mapping to bring remote ITV in connection with their servers.

The link also provided connectivity for the *Black Rock Gazette*, a daily paper published at Black Rock City. The wireless LAN also connected several theme camps where participants could collect their e-mail.

William Mutual, president and chairman of ITVnet, said the



company produced video vignettes for its Web site (www.itv.net) and broadcast live from the desert.

ITVnet, has "provided live Webcasts from the top of the Himalayas to the bottom of the ocean and have been searching for a remote high bandwidth delivery mechanism," said Mutual. "This is a transport mechanism we plan to use on a regular basis."

- Ann Harrison

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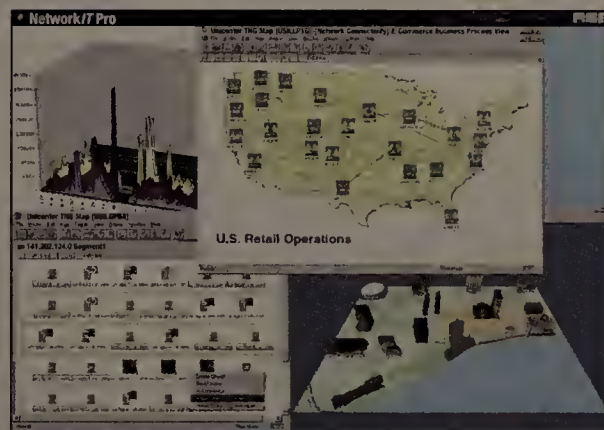
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Tools Boost Company's Sales Productivity More Than 20%

BY MATT HAMBLIN

Sales force automation tools sometimes cause problems because sales agents don't

like managers to force tools and procedures on them that take time away from selling and earning their sales

commissions, according to analysts.

But at Mentor Graphics Corp., a software tools devel-

oper in Wilsonville, Ore., widespread deployment of a sales methodology combined with automation tools resulted in

more than a 20% increase in sales productivity, Mentor officials said.

Since 1996, Mentor Graphics has used the Target Account Selling method from OnTarget Inc. in Atlanta combined with Siebel Sales Enterprise from Siebel Systems Inc. in San Mateo, Calif. Mentor has spent \$1 million on the two products since 1997.

Last month, OnTarget and Siebel announced a formal alliance of the two products for sale to businesses worldwide.

Mentor ties nearly all its employees into the system, including engineers who are building software products, to create a team that analyzes potential contracts to make predictions about the outcome, according to Steven Blum, vice president of the Americas at Mentor.

Team Spirit

That team approach requires salespeople to share goals with others and hear feedback that they otherwise wouldn't have, which isn't always an easy proposition, Blum said.

For sales force automation to work, "you have to have a strong buy-in from salespeople and a buy-in from managers constantly reminding them of the value," he added.

Mentor used Siebel's tools to automate the OnTarget method in 1996. An internal study last year found that the combined system was lowering the cost of sales, increasing the success rate when salespeople pitched new accounts and lessening the sales cycle time, Mentor officials said.

Blum said there was initial resistance by ego-centered salespeople, as well as some early problems in getting various versions of OnTarget available for the Siebel tools.

The Siebel-OnTarget partnership indicates a trend in sales force automation toward finding ways to "not just automate the sales process, but to make the salesman's job easier," said Christopher Fletcher, an analyst at Aberdeen Group Inc. in Boston.

Sales force automation is moving toward "sales effectiveness systems," where pricing and configurations of products are combined with information about potential customers, Fletcher said. ▀

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BRIEFS

Ingram Micro Warns
On Sales, Seeks CEO

Wholesale systems distributor Ingram Micro Inc. last week said its third-quarter earnings will be lower than expected and that it is looking for a new CEO. The Santa Ana, Calif.-based company said revenue for the quarter will be between \$15 million and \$21 million, down from \$60 million for the same quarter last year. Jerre Stead, CEO and chairman since 1996, will keep his chairman's post but step aside from CEO duties when a successor is named.

American Express
Unveils Online Card

American Express Co. said it will release a version of its credit card specially designed for shopping online. The card contains a smart chip to provide security in Internet-based transactions and will have a magnetic stripe for point-of-sale transactions. The company in November plans to offer an online wallet at its Web site.

HP Settles Suit

Micro Solutions Inc. has settled its patent infringement lawsuit against Hewlett-Packard Co. over storage design. HP acknowledged infringing on Micro Solutions' patents for parallel-port-attached mass storage devices, such as CD-ROM drives, according to Micro Solutions in DeKalb, Ill. A statement from HP said the company settled rather than engage in lengthy litigation.

Short Takes

E-commerce services vendor **CONCENTRIC NETWORK CORP.** in San Jose said it would acquire **INTERNET TECHNOLOGY GROUP PLC**, a London-based Internet access provider for European businesses, for \$215 million. . . . Citing savings from its Internet sales, **DELL COMPUTER CORP.** cut prices on its line of OptiPlex business PCs by up to 9.7% last week. . . . Internet service provider **PRODIGY COMMUNICATIONS CORP.** said it will buy **BIZONTH.NET**, a small-business Web-hosting company, for \$100 million in stock and cash.

Intel Adds to Its Portfolio
Of Network Products

Chip maker announces switch, routers; continues diversification

BY MATT HAMBLIN

INTEL CORP. last week announced three new networking products for midsize businesses that will help round out its switch and router portfolio as it moves beyond its reputation as a chip maker.

Intel has sold network gear for several years but last year took a big step by purchasing remote access provider Shiva Corp. In April, Intel further tried to diversify by entering the Web outsourcing arena to host, manage and store Web content [News, April 26].

The new switch and two new routers are specifically intended for workgroups in midsize businesses — a sweet spot in the overall market, which is dominated by San Jose-based Cisco Systems Inc. and several larger players, analysts said.

Intel grabbed only about 1% of the second quarter's \$3.5 bil-

lion in global revenue for switches, ranking it ninth among switch vendors, according to International Data Corp. (IDC) in Framingham, Mass.

Switch Hitters

Global switch revenue share for Q2 1999

Cisco Systems	48%
Nortel	12%
3Com	11%
Cabletron	7%
Fore Systems	4%
Hewlett-Packard	4%
Xylan Packet Engines	3%
Lucent Technologies	2%
Intel	1%
Others	8%
Total revenue: \$3.5B	

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

However, the switch market is so huge and growing so quickly that earning even 1% of the revenue is important, said Esmeralda Silva, an analyst at IDC. The new Intel 6000 Series switch "is a nice product for Intel and rounds out their solution for businesses," she said.

This is the first switch Intel has offered for the data center; it features several times the number of ports that the company's existing products have, with room for 32 Gigabit Ethernet or 96 Fast Ethernet ports. At \$14,000, the switch will cost about 20% less than what Cisco charges and is Intel's first chassis-mounted model in that class, Silva said.

Intel isn't showing interest yet in building products for the largest global networks for big companies, an area dominated by Cisco and Nortel Networks in Dallas.

ICM Inc., a networking consultancy in Bellevue, Wash., is buying one of the new Intel routers, the 9520, for internal

use, after having tested and installed it two months ago, said Robb Karcsay, network engineer at ICM.

The new box replaces three Cisco boxes designed to handle Integrated Services Digital Network, frame-relay and LAN traffic and should reduce some administrative headaches, he said.

"I was really impressed with how easy the Intel box was to configure," Karcsay said. "The software on the Cisco boxes was so complicated."

He also estimated that at \$1,749, the Intel product probably cost him half as much as he might have paid to Cisco or other large vendors.

Paul Strauss, an analyst at IDC, said he believes Intel's new routers are attractive products but adds that it "remains to be seen" whether Intel can grab market share from the leading router vendors, led by Cisco.

"The Intel name stands for something, and they have enormous distribution capabilities worldwide. But to seize market share is very tough," he said. ▀

Dell to Acquire ConvergeNet

*Gains storage-area
net technology
in a \$340M deal*

BY JACK MCCARTHY
SAN FRANCISCO

Dell Computer Corp., in a bid to boost its network-attached storage offerings, last week said it would buy privately held ConvergeNet Technologies Inc. in a stock deal worth \$340 million.

San Jose-based ConvergeNet offers data storage products and technologies that help corporations build storage-area networks (SAN).

Dell entered the storage market last year when it launched the PowerVault 650F storage subsystem, which offers up to 2T bytes of data storage in one rack. The line was expanded to include a tape library, a RAID con-

troller and network-attached storage products.

The SAN market, which includes systems that can range in price from \$20,000 to millions of dollars, has drawn a crowd — expanding beyond traditional storage behemoths such as IBM and EMC Corp. to include Compaq Computer Corp. and network management vendor Computer Associates International Inc.

Dell plans to use ConvergeNet's SAN technology to allow its PowerVault storage products to connect to Intel-based or RISC-based servers running flavors of Unix, Windows NT, Windows 2000, NetWare or Linux operating systems.

Dell, based in Round Rock, Texas, said the deal should be completed in 60 days. ▀

McCarthy writes for the IDG News Service in San Francisco.

Sun Seeks to Beef Up Sales
With Net Consulting Services

*Server vendor sees
growing need for
back-end support*

BY STACY COLLETT
NEW YORK

Known for its servers and Java programming language, Sun Microsystems Inc. is moving to grow its Internet-related services business.

Sun is offering its Web architecture expertise through Sun.Com Consulting services, which will help companies set up or expand e-commerce sites quickly.

Officials said Sun.Com Consulting will supply technology

and assistance to systems integrators hired by companies to design and build the back-end systems that support Web sites for both business-to-business and business-to-consumer interactions.

Sun plans to bring together accelerated implementation methods developed by integrators with its own technology architecture to get portals up and running quickly, said Mark Bauhaus, vice president at Sun.Com Consulting.

The Sun.Com practice puts a new face on Sun's existing services unit, which grew in fiscal 1999 to \$1.6 billion in revenue, a 45% hike over the previous year. ▀



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To serve clients better than the competition, all Chase Global Investor Services has to do is know more than anyone else and execute flawlessly anywhere. New business integration software from IBM is helping them do just that.

In financial services, information is the raw material of new services and the bond in customer relationships – which are everything to Chase. To add value for clients, many of whom are financial leaders themselves, Chase is leveraging IT assets across business units in a dynamic new way. Instead of integrating systems one by one, they are integrating business processes from end to end with powerful new software from IBM.

This business integration software is designed to work across 100% of all systems in commercial use. At Chase, it is eliminating technology barriers among mainframes, UNIX[®] and Windows NT[®] environments, transforming Chase's custody business units everywhere into a single worldwide platform. For example, data from 83 markets and 30 external vendors is now validated automatically by MQSeries[®] Integrator as it arrives. Workflow is directed to the units best able to execute before market deadlines pass, affording Chase more time to analyze the world's financial information and apply it to the business.

As business goals evolve, the IT infrastructure is “already ready” to respond – a strategic advantage for Chase. “This allows us to stretch our imaginations,” says Global Technology Executive Paula Sausville-Arthus, “to deliver really powerful solutions to the business.” IBM business integration software is also stretching imaginations at companies as diverse as Toyota and Texas Instruments. You'll find their stories and others at our Web site.

For business integration case studies in different industries, InfoPack and free seminars, visit us on the Web at www.ibm.com/software/big/systems

MQSeries family

This business integration software is designed to work across 100% of all systems in commercial use with assured delivery. Message content is automatically reformatted for the needs of unlike applications.

SecureWay[®] software

Integrates directory, connectivity and security to help you build a rock-solid network platform for all your e-business applications—while reducing overall complexity and costs.

WebSphere[™]

WebSphere Application Server extends core business functions to Web clients and vice versa. Built-in connectors to databases and other systems help meet high transaction demands on existing and future applications.

VisualAge[®] for Java[™]

This Java development environment enables you to quickly build secure e-business applications and extend existing information to the Web without rewriting applications from scratch.

IBM software can help you build, run and manage integrated applications across business units.

MARYFRAN JOHNSON

'The Power of Now'

ENCOURAGE your prima donnas. Quit worrying about long-term strategic plans. Wake up to the mediocrity of the team-player mentality. Oh, and send the CEO out to talk to your unhappiest customers. Those are a few of the snappy, provocative ideas in Vivek Ranadive's new book, *The Power of Now*, which champions the creation of "event-driven" companies that recognize and respond to real-time information about customers, markets and business opportunities. Ranadive is the founder and CEO of Tibco Software, a Palo Alto, Calif.-based maker of real-time software used by companies such as Bechtel, Cisco Systems, Nasdaq, Yahoo and Goldman Sachs. These companies show up in his book as real-world testimonials to customer-centric thinking based on real-time information — distributed Internet-style.

I confess I have more than a passing interest in this book. *The Power of Now* is the first in *Computerworld's* Books for IT Leaders series, our publishing venture with Computing McGraw-Hill, a division of The McGraw-Hill Cos. It's also the first title to join our new Books for IT Leaders page on www.computerworld.com, where you can peruse the chapters and then purchase it. (Just click on the Resource Center tab on our home page and follow the links.)

Many business book writers these days



MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

discuss technology in vague, reverential tones with liberal sprinklings of clichés about competitive advantage. But not this guy. Ranadive dives into actual specifics about IT infrastructure, discussing middleware and multicasting in terms that businesspeople and nontechnies can learn from and appreciate. He argues — very convincingly — that it's far better to innovate and fail than stick with the "mediocre status quo." He trashes the whole

client/server database-driven approach to computing and derides the "deceptive, lazy comfort" of closed systems such as proprietary supply chains and electronic data exchange systems.

"Value thrives in open systems like the Internet," Ranadive insists. If he's right, then every company has a good chance of leveraging today's technology for its own kind of customer-centric thinking. ▀

PETER SQUIER

America needs a tax credit for IT training

WHAT REPRESENTS more than 50% of all new capital asset purchases? What has restored America as the undisputed economic powerhouse of the world? What sector has led the longest bull run in our stock market's history? What industry has a negative rate of unemployment?

You know the answer. The U.S. can't get enough of information technology. Nearly every company lists IT as one of its highest priorities and one of its biggest headaches.

The reason is always the same: finding people who can make IT happen.

How do we fix the problem? By getting smarter and more skilled people — and I don't mean by importing them from another country. We must make a constant, deliberate effort to train IT professionals. We must aggressively teach them the skills they need if we're to realize a return on our IT investment.

Why aren't we doing enough training? Because it's too darned expensive in terms of money and time. How many companies can afford to spend thousands of dollars per year per employee on authorized, certified training? The economic burden is particularly hard on the smaller and mid-size U.S. companies that are really fueling our economic growth. We end up skimping — neither providing enough training to those we train nor training enough people. Then we wonder why our systems aren't working well and why those we train leave for greener pastures.

The answer is to offer a corporate tax credit of 20% to 25% on the first \$6,000 of each employee's annual IT training. That's the idea behind Senate Bill 456 and House Bill 838. These bills have gathered bipartisan support from more than 40 cosponsors. Just last week, Vice President Al Gore adopted this tax credit as part of his presidential platform, citing the need to prepare America for the "innovation age."

The IT training tax credit has strong support



PETER SQUIER, president of the Information Technology Training Association and a senior vice president at Productivity Point International, is co-chairman of the Technology Training Tax Credit Coalition. Contact him at psquier@propoint.com.



SPECIAL ADVERTISING SUPPLEMENT

White
Paper

SEPTEMBER 13, 1999



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COMPUTERWORLD

Convergence and Customer Relationship Management

CONVERGENCE AND

Customer Relationship Management

By
Bill Hills
Aberdeen
Group

Three Convergences

The convergence of carrier and enterprise voice and data networks is clearly an extremely important development. How important is it, however, from the perspective of customer relationship management (CRM)? At the level of the enterprise call center, a cornerstone of any CRM infrastructure, it looks as if voice/data convergence will happen fairly gradually, and over the medium term. There is simply too much legacy investment in circuit-switched systems. For the near term, most customer communications will come to organizations by way of circuit-switched calls and fax. There will be some "green field" situations, where large organizations set up segregated packet-switched call centers and branch offices, or where start-ups begin with converged voice/data networks. Yet the norm in the enterprise will probably be a gradual shift to the new technology over the medium term, blending the new switches into existing legacy circuit-switched networks. This shift is very important, but it will not happen overnight.

For customer relationship management, there are two other convergences that are of more immediate importance. These can be called customer communications convergence and customer information convergence. Each of these convergences is being forced upon organizations because of two revolutions in two areas: communications and e-business. In the following white paper, we will look briefly at each of these two convergences, and consider their impact on the ways organizations manage customers.

Convergence of Customer Communications Streams

From the customer side, multiple communications channels and devices are pervading the enterprise. Customers are increasingly using e-mail and Web forms in their dealings with companies. They tend to do this now via Web sites, using desktop PCs, but they will increasingly do so from mobile data devices as well. They will also increasingly use mobile phones, with separate phone numbers, for public switched telephone network (PSTN)-based communications.

This use of multiple customer communications channels and devices puts organizations receiving these communications in the position of having to re-converge them into a single information stream. For CRM, solving the problem of converging customer communications channels may well be the most pressing convergence in the near term.



Bill Hills is Senior Analyst for telecommunications software at Aberdeen Group. He covers carrier telecommunications software, computer telephony, and telephony-based voice recognition applications. He has previous experience as an analyst covering customer relationship management (CRM) applications in the Enterprise Business Applications group at Aberdeen, and was a co-author of the three editions of Aberdeen's *Managing Customers with Next-Generation Software Applications*. He has authored numerous Aberdeen Group publications on computer telephony, CRM, and telephony-based voice recognition, including the report, *Communicating Business Intelligence Through Computer-Telephony Integration*.

Presently, there is little converging of the different ways customers communicate with organizations. Enterprises can receive customer communications via e-mail and Web forms, but they rarely can converge these separate communications streams together with PSTN-based calls and faxes, let alone treat them as a single stream of information upon which they can act (Figure 1).

This scenario runs counter to customer expectations. Customers are now coming to expect e-mails, voice messages, cell phone-based short text messages, and faxes to be just as valuable as a telephone call to the call center. The fact that some messages are shorter, and may come in store-and-forward form, doesn't make them any less important in the eyes of customer. In personal communications, we now expect the e-mail, faxes, voice mail, and phone calls to be of equal value, and to be cumulative in effect. We expect our friends and family to have received our voice mails and e-mails, and to have processed this information together with whatever we've discussed in real-time communication over the phone or face-to-face.

CRM Suppliers and Customer Communications Convergence

Suppliers of CRM applications, computer telephony applications, and voice switch products have all become acutely aware of the customer communications convergence problem. It is one of the central problems raised by the emerging e-business infrastructure. It is e-business that has raised e-mail and Web form fill-ins to the level of mission-critical customer communications. In an e-business world, even if most customer interactions happen via PSTN

telephone calls and faxes, new media is becoming increasingly popular.

The traditional computer telephony and voice switch suppliers in particular are being increasingly drawn into the CRM market. To one degree or another, companies such as Aspect, Genesys, Lucent, and Nortel Networks are all positioning themselves as CRM suppliers. They use the term CRM to refer to many of their customer contact center offerings which were previously named in terms of computer-telephony. It turns out that they have a very important role to play in solving the problem of converging customer communications channels in an e-business age. They will be providing much of the technology and applications needed to converge the separate communications channels.

There are also the more specialized suppliers of applications that manage new customer interaction channels. Suppliers of e-mail management applications, customer self-service applications, Web collaboration applications, and personalization applications all have roles to play in CRM. Their systems must in turn be integrated with both the systems of the switch and CTI suppliers, and of course those of the front-office and back-office suppliers whose applications were once exclusively called CRM applications.

Convergence of Customer Information Systems

As already mentioned, it is rare for organizations to be able to converge customer communications into a single stream, and rarer still to act on them. The dotted lines and unshaded portions of Figure 1 illustrate the fact that, for most organizations, these are capabilities yet to be

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THE Aspect

Customer Relationship Portal:

Facilitating True Convergence of Customer Contacts.

This story was written by David Puglia, vice president, product marketing, of Aspect Telecommunications. The story was supplied by Aspect and has no connection to the rest of this supplement written by Bill Hills of the Aberdeen Group.

The convergence of voice and data networks presents a significant problem for many companies and their contact centers: How do you maintain your investment in equipment, staffing and training while satisfying customer demand for mixed-media contacts? In addition, how do you enhance your customer relationship management (CRM) strategy by using the knowledge gained from these mixed-media inputs to maintain, expand, and strengthen customer relationships?

Consistent Interactions

The Aspect® Customer Relationship Portal provides the solution to both challenges. The Aspect Customer Relationship Portal is a virtual place where customers can be matched with enterprise resources regardless of the medium of contact: telephone, fax, e-mail, or Web. Because the portal utilizes an open architecture that meets voice and data standards, it allows you to leverage your existing IT infrastructure. But more than that it allows you to implement an effective CRM strategy that is consistent across all media.

The Aspect Customer Relationship Portal allows you to:

- Blend telephone calls, e-mail, fax, and Web contacts together to provide consistent customer interaction for all types of contacts
- Integrate key elements of your CRM solution-front-office and back-office applications, ACDs, IVRs and databases-into a seamless system
- Combine and utilize the information collected from multiple

resources to enhance business functions such as sales and marketing, as well as customer service, and create a coherent process for managing profitable customer relationships.

The Foundation of CRM

The Aspect Customer Relationship Portal is a software application that gives your customers a consistent experience whether they contact you by telephone, fax, e-mail, or the Web. That is why Aspect refers to the portal as "the foundation of an effective CRM strategy." Without the intelligent, business rules-driven routing and queuing that it provides, and without its ability to handle all contact media according to those business rules, truly successful CRM can never be fully leveraged. Because of that, the Aspect Customer Relationship Portal is vital to a company's ability to fully realize the benefits of CRM.

Customer Relationships in an E-Business Environment

The promise of the Internet as a medium of commerce is enormous. But there are significant hurdles to

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be overcome before that promise is fulfilled. Chief among the obstacles to success is the difficulty in providing customer service and support over the Internet.

Consider this:

"67% of online purchases are never completed, largely because top e-commerce sites have made few provisions for real-time, online customer service and support."

—USA Today, Money, June 1, 1999

Amazing. Over two-thirds of potential sales on the Web are lost because of a lack of customer service.

Here is where the Aspect Customer Relationship Portal can make a difference. Essential information like case histories, account balances, and product configurations can appear on an agent's screen at the same time the customer makes contact, every time, no matter what media the customer uses.

This allows the agent to provide more consistent service, more efficiently. Customers feel that your company knows them individually and understands their unique needs. And agents have access to information about your products and sales campaigns, enhancing their ability to cross-sell and up-sell.

Provide Consistent Service in Mixed-Media

Through its media blending option, the Aspect Customer Relationship Portal enables your con-

tact center to accept mixed-media contacts and queue and route them together according to criteria set by your business managers to agents who are able to handle all forms of contact. Desktop software enables your agents to productively respond to all contacts. From a single desktop, agents can:

- Communicate with Web customers using text chat, IP telephony or whiteboarding
- Answer e-mail, with options for utilizing EMRS software that lets agents reply using prewritten responses, attach files and Web URLs, and more
- Access front-office and back-office applications via CTI screen-pop

Not only does this provide your customers with the service they demand (regardless of how they choose to contact you) but it allows you to tailor your responses based on business rules. You can prioritize contacts from your best customers, route contacts to the agent best equipped to deal with that particular customer, and make more efficient use of your contact center resources overall.

Why Aspect?

Aspect Telecommunications is uniquely poised to help companies implement customer relationship management strategies. With over fourteen years delivering customer relationship solutions, first in call centers and now

in complex customer contact centers, and 3,500 mission-critical solutions installed worldwide, Aspect is the leader in CRM delivered in a converged environment. Their core competencies—strength in skills-based routing, media blending, and reporting—are exactly those that matter most to CRM. Add to that the Aspect Customer Relationship Portal. It is the one virtual place that connects your customers with the right enterprise resources no matter how customers contact you. Together, the Aspect Customer Relationship Portal and other available Aspect applications provide a total solution to support your CRM strategy.

In the converged world of voice and data, PSTN and IP contacts, you need to offer your customers a consistent contact experience that builds and strengthens the relationship. Aspect has the tools and experience to help you do just that.

*For further information
call 888-412-7728 or visit
www.aspect.com/cw.*

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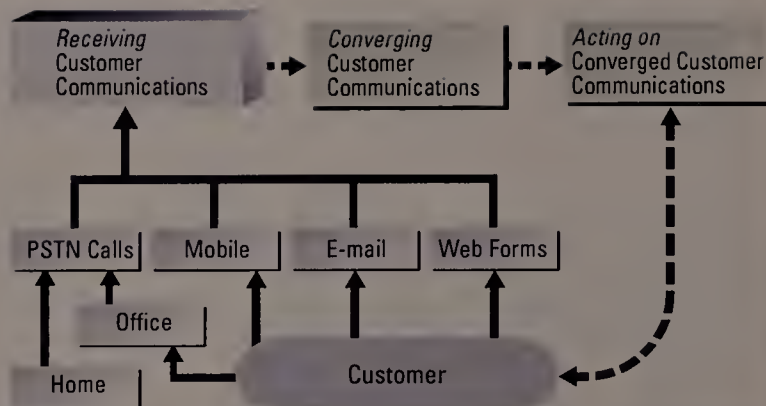


Figure 1. Receiving, Converging, and Acting On Customer Communications
The shaded boxes and solid lines in this illustration indicate currently available capabilities. The dotted lines and unshaded boxes represent capabilities not yet acquired by most organizations.

acquired. The fact that customer information is scattered across organizations also indicates a deficiency. Thus, bringing all the right customer-relevant information together and applying it to interactions with specific customers is the second form of convergence required by CRM.

The need for this convergence is due in part to the fact that many conventional front- and back-office applications were implemented consecutively and in relative isolation, and were not necessarily designed to communicate with each another. During the past two or three years, however, enterprise organizations have worked hard to solve this problem. Furthermore, there has been significant industry consolidation on the part of front- and back-office suppliers, and this has furthered the cause of customer information convergence. Nevertheless, we are still far from a world in which the CRM systems are sufficiently coordinated with themselves or back-office systems.

There is another significant customer information silo that has recently developed. As organizations have rushed to take part in the e-business revolution, they have treated the Web, at least in initial efforts, as a largely separate, disconnected business entity. The result is that e-business initiatives often create isolated islands of customer information. Interactions with customers whose activities span the e-commerce operation and the traditional call center operation, for example, often become clumsy, or even subject to the "corporate amnesia" effect, in which the customer service representative in the call center is utterly unaware of a customer's interactions via the Web. In effect, the company appears not to know the customer with whom it recently interacted. The task of integrating customer information taken through e-mails and Web forms with that taken through traditional call centers has only

just begun. Until organizations do this, they will appear "forgetful" to their customers, unable to act consistently across all customer input.

At the same time, many of the "dot.com" companies have overlooked the demands of customer service and support. They have spent large sums on transaction processing, fulfillment, and marketing initiatives, but neglected the customer service and support demands generated by e-business. While they automate marketing and sales to an impressive degree, it seems that successful e-commerce initiatives increase rather than decrease customer support and service interactions. With more reachable customers, and more opportunities for each of these customers to interact with the organization, service interactions invariably multiply. To meet the resulting demand for customer service, the dot.coms must develop and integrate automated and conventional CRM systems. They must also integrate the information these systems generate. After all, e-customers can easily find another company if they receive poor customer service.

Further Needs

Once customer information is more integrated and available, more work remains. Converging communications streams and customer information provides the where-withal for CRM to be deployed in far more strategic ways. CRM systems still lack two overarching functions. The first is a business rules engine that brings the converged information to bear on each customer interaction just before it happens, as it happens, and after it happens. It would act in a way similar to service control points in the intelligent network of the public switched telephone network (PSTN), or to directory services on a data network.

COMPUTERWORLD

This White Paper was created by Computerworld Custom Publishing. Comments can be sent to editorial director Ellen Fanning at (508) 820-8289 or email at ellen_fanning@cw.com. This White Paper, as well as other custom supplements, can be viewed online at www.computerworld.com.



What's needed is a master customer relationship management nerve center that continually manages and applies company-defined rules for applying resources to customer interactions. The goal should be for every customer interaction over any customer interaction channel to be treated according to all the business policies relevant to that particular customer. Minimally, this requires a business rules engine that spans a company's entire CRM operation, including converged communications channels, customer information, applications, and business functions. For such a business rules and workflow engine to act truly as a nerve center, it must be easily modifiable by personnel closest to the various processes involved.

Finally, in addition to receiving customer communications, integrating the information contained in them, and applying rules governing how individual customers are to be handled, CRM systems must have the intelligence required to analyze and remember what they are doing. They need to have a detailed and evolving knowledge of the organization's interactions with its customers, and the ability to analyze the data preserved in that memory. Analysis results must be provided to personnel responsible for creating and managing the business rules that guide customer interactions. The goal is having this feedback loop make CRM systems adapt better and more quickly to customer and operational needs.

The need for this intelligence is the rationale behind integrating a dedicated decision support system containing a centralized data repository into the CRM infrastructure. Considered by many as a luxury, integrated decision support will likely become a regular feature of enterprise CRM.

CRM Suppliers and Customer Information Convergence
All parties to the broadened CRM market are aware of the

customer information convergence problem. And some suppliers are taking a leading role in offering solutions. Aspect Communications, with its Aspect Customer Relationship Management Portal, and Hewlett-Packard, with its Smart Contact and Front Office programs, are especially worthy of note. Notably, neither of these companies is a front-office application supplier per se, although both have partnered extensively with traditional CRM suppliers.

Aspect and HP understand the challenges of CRM in an e-business world, and have developed comprehensive systems that integrate traditional and Web-based CRM applications. They have also provided these systems with the crucial ability to converge customer communications channels and customer information. Moreover, Aspect, offers an integrated data mart with its solution.

The Customer is King

It is often said that in an e-business world, the customer is king. This is usually a reference to the fact that e-business makes much greater market efficiency possible on the buyer side. If customers don't like what you have to offer, they can fairly easily inspect competing offerings and prices, and go elsewhere. Companies therefore must work harder to retain customers in the e-business world. One of the ways they do this is through better customer service and support.

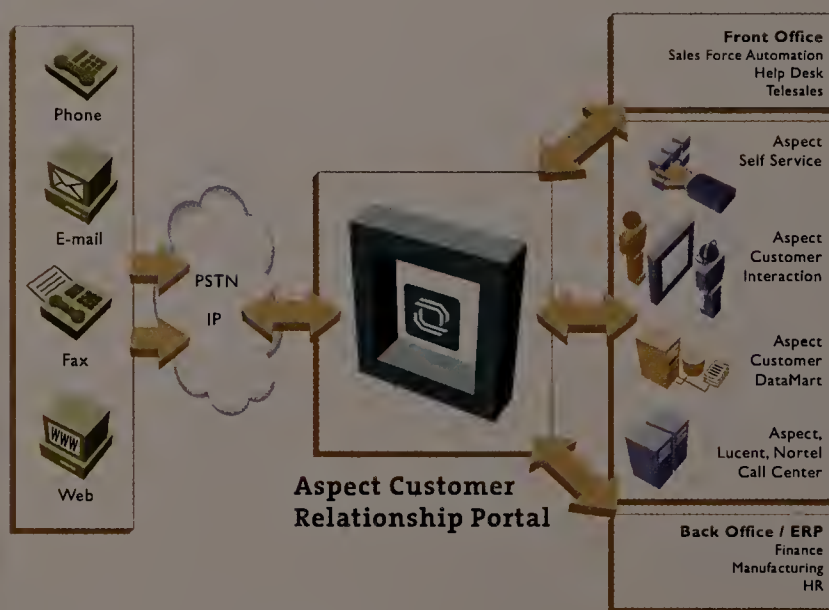
Better customer service and support depend on converging: A.) communications channels and B.) information about, and relevant to customers. The customer is king, and these days the king does business through multiple communications channels. In his imperious manner, he assumes that companies will quickly understand and satisfy his needs. If not, off with their heads! ♦

"IT USED TO BE THAT CUSTOMERS ONLY CONTACTED US ONE WAY—BY PHONE. THEN CAME CONTACTS BY FAX, THEN E-MAIL AND THE WEB. THE ASPECT CUSTOMER RELATIONSHIP PORTAL ENABLES US TO OFFER A CONSISTENT EXPERIENCE TO ALL OUR CUSTOMERS.

AND, IT STILL ALLOWS US TO TAKE ADVANTAGE OF OUR EXISTING SYSTEMS.

THAT'S IMPRESSIVE."

—TIM KOWALSKI, CIO AND SENIOR VP OF SYSTEMS AND TECHNOLOGY, ICT GROUP



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The Internet has forever changed the nature of customer contacts. Where there was one medium, the telephone, there are now multiple media—phone, fax, e-mail and Web.

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Put your CRM strategy on a solid foundation. Get the Aspect Customer Relationship Portal. We think you'll be impressed. We know your customers will be.

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from industry. It is supported by the Information Technology Training Association, a plurality of whose members come from corporate IT — companies such as Marriott, Bank of America and GTE. This association has joined more than 30 major IT companies and trade associations to form the Technology Training Tax Credit Coalition (www.techcoalition.com).

One thing is just as certain as the shortage of IT workers: A tax credit will never happen unless we aggressively support this initiative through our local legislators.

America's economic prosperity depends on keeping our IT engine well oiled. Increasingly, the oil is our people. The No. 1 reason people cite for why they don't do more training is they simply can't afford it, and this legislation will make training costs less of an issue. Let's get an IT training tax credit passed and end the skills shortage of our IT professionals. ▀

DAVID MOSCHELLA

Each round of poker could be Bill Gates' last

THUMBING THROUGH a month-old *New Yorker* on a Cape Cod beach, I chanced upon one of the most remarkable paragraphs I have seen in my 20 years of following the IT industry. On page 44 of the Aug. 16 issue, the redoubtable and highly reliable Ken Auletta writes the following:

Justice officials argued that Microsoft's power was impregnable because consumers were so dependent on Windows.

Gates exclaimed, "You give me any seat at the table" — he mentioned Linux, an upstart operating system, and Java, a computer language created by Sun Microsystems, a Microsoft foe — "and I can blow away Microsoft." If his competitors had half a brain, he was suggesting, Microsoft would be toast.

Now we can probably all agree that this statement gives new meaning

to the word *impolitic* — just imagine how Messrs. Balmer, Maritz et al. might react. But we can never really know whether this was just a regrettable example of executive trash talk, blurted out in a moment of pique, or whether this is something Bill Gates truly believes. Either way, it certainly makes for an interesting intellectual proposition, one that Microsoft's competitors might do well to ponder.

Although at first glance Gates' claim might seem preposterous, the historical evidence actually argues otherwise.

The strategic errors of competitors have been a huge part of the Microsoft story — e.g., IBM's licensing of MS-DOS; Apple's refusal to unbundle its graphical interface software; the petty, self-defeating rivalries within the Unix community; the numerous blunders of Lotus, WordPerfect, Novell and many others.

I have always believed that even Microsoft's all-out assault upon Netscape could have been effectively countered. All Netscape had to do was align itself with a rich technology partner such as IBM, Oracle or Sun so that it could maintain its once-formidable browser market lead, while still matching Microsoft's giveaway pricing and aggressive distribution strategy. Instead, Netscape chose to become an enterprise software firm, alienating the very partners it needed. The results were predictable.

This brings us to today's game, where there are essentially four new players — three betting on software, one on hardware.

The software group includes the entire open-source movement led by Linux; Sun's efforts with Java, Jini and its recently acquired office software

maker, Star Division; and the whole Web services crowd, which includes AOL, Yahoo and many others.

Joining these three are the non-PC, non-Windows hardware vendors with their PDAs, set-top boxes, Web appliances, smart phones and whatever comes next.

If Gates were to cash in his Microsoft chips and decide to play any of these hands, could he really win again? Whose hand would he choose? Conversely, which seat would Scott McNealy really prefer, his or Gates'? Obviously, we will never really know. But we do know that, although long-term planning often seems obsolete in today's fast-moving IT industry, actual company strategy remains as vital as ever.

Industry executives and analysts often mistakenly talk about strategy as if it were some kind of chess match. But in chess, you have just two opponents, each with identical resources, and with luck playing a minimal role. The real world is much more like a poker game, with multiple players trying to make the best of whatever hand fortune has dealt them. In our industry, Bill Gates owns the table until someone proves otherwise. And as they say on TV, if you can do it, it ain't bragging. ▀

READERS' LETTERS

Hell on wheels

IREAD with interest the article on Internet connections for cars ["Surf While You Drive," News, Aug. 16]. Frankly, the idea scares the hell out of me. I am already forced to commute with various morons who tear along at 65 to 75 mph while doing one or more of the following: eating breakfast, putting on makeup, shaving, reading a newspaper, talking on a cell phone.

Web surfing is one more distraction we do not need on the roads, and I hope the DOT, FCC or some other government agency has the sense to kill this turkey. **Jim Matthews**
Washington, N.J.

Don't forget Apple

ICOULDN'T help noticing (with much chagrin) the misrepresentation of information in the article "Too Much, Too Fast" [Technology, Aug. 16]. In discussing the computer industry's

desire to leave legacy equipment behind in favor of newer technologies, you state that Intel and Microsoft are spearheading these plans.

Wasn't Apple Computer the first to introduce a machine that lacks a floppy drive and serial ports? In fact, if I remember correctly, shortly after the introduction of those blue boxes, *Computerworld* writers called the idea "Steve's Folly" or something along those lines. How quickly we forget.

Kevin McDonald
Henrietta, N.Y.
hammerl@frontiernet.net

IT worker shortage a global problem

THE ARTICLE "GOP Eyes Boost in Foreign Workers" [Page 1, Aug. 9] made interesting reading.

As a software professional who has worked in India, England and the U.S., I can understand why American companies are lobbying hard to

increase the H-1B visa cap. It is in their interest to employ a highly qualified workforce in order to remain competitive.

The shortage of qualified and experienced software professionals is not restricted to the U.S. The fact remains that highly qualified foreign professionals are extremely mobile and willing to move to any country where there are better opportunities and work conditions and fewer restrictions, either legal or work-related.

Mohan Babu
Professional Services Division
Compuware Corp.
Colorado Springs
mohanbabuk@rocketmail.com

IT dictator wanna-be would serve users

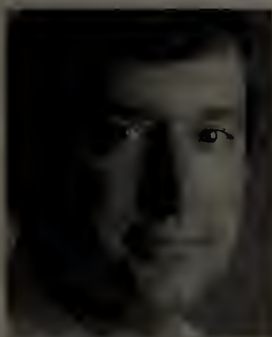
IF I WERE the IT dictator ["If I Ran the IT World," Business Opinion, Aug. 9], there would be a much better balance between conserving IT resources and serving users' (and external customers') needs.

Performance standards and compensation for all IT staff, from the CIO down to the help desk, would be determined by their end users and would be based largely on the extent to which the IT staff helped users meet their own performance standards.

I know there is an urge to standardize everything to reduce maintenance costs and minimize downtime, but when standardization starts to limit innovation and creativity within the ranks of those who produce the product/service that pays everyone's salary, it becomes a liability.

M. Steinke
Camas, Wash.

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Allan E. Alter, columns editor, *Computerworld*, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 875-8931; Internet: letters@computerworld.com. Include an address and phone number for immediate verification.



DAVID MOSCHELLA is an author, independent consultant and weekly columnist for *Computerworld*. Contact him at dmoschella@earthlink.net.

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JOHN GANTZ

Here's my top 10 list of IT issues; What's yours?

EXPERIMENT TIME. I have to give a speech next month on the top 10 issues driving IT. I'm going to run my list by you, and if you think you've got an issue that's bigger than any of my 10, please e-mail me. I'll send you the final list. Think of this as open sourcing my speech.

My list — not in any particular order:

1. **Y2K.** 'Nuff said.

2. **Easy money.** Between 1996 and 1998, high-tech stock valuations grew 16 times faster than revenue. Pretty good. Internet stocks, however, grew more than 50 times faster than revenue. Pretty crazy. This is driving a new wave of mergers and acquisitions, not to mention stealing some of our best and brightest from corporate America.

3. **The people shortage.** Still a big deal.

4. **The rising importance of IT.** Everything is mission-critical.

New online divisions are being funded by some of the stodgiest companies, and new job titles like VP of interactive services, Internet marketing manager and VP of e-commerce are edging into territory once solely owned by the CIO.

5. **The growth of consumer information appliances.** In 2003, there will be 600 million or so PCs able to access the Internet. But there will also be 300 million handheld Internet appliances, 2 billion consumer devices and 50 million vehicles with the potential to connect to the Internet. The PC is drifting away from the center of our IT universe. In your universe, this will first manifest itself as a lot more devices on your networks, like smart handhelds, for instance. Later it may show up as less attention from vendors as they divert resources to the consumer market.

6. **The Internet.** Need we say more?

7. **Internet commerce.** More than a trillion dollars in goods and services in 2003, and more than a trillion dollars in corporate investment in Web sites.

8. **Disintermediation.** This is the big word that means using IT to cut out the middleman in business transactions. It's Merrill Lynch knocking under and launching an online discount brokerage service. It's the auto industry buying and selling auto parts over the Automotive Network Exchange Web site. It's a third of all U.S. PCs being sold through the direct channel.



JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at jgantz@idcresearch.com.

Disintermediation is a big deal in every industry, and the business models that IT managers and CIOs have to support will be changing rapidly and radically.

9. **New technology.** Two examples I like to use are Sun's Jini and Internet 2. The former promises to make wide-area computing as practical as local-area computing. The latter means we'll soon have an Internet geared for commercial transactions and performance needs.

10. **Microsoft's behavior.** Look where the company is investing its money. In the first six months of this year, Microsoft announced almost \$6 billion in investments to support broadband communications, making deals with AT&T, NTL, Qwest Communications and others. It put \$700 million into deals with platform companies like Banyan, Nextel Communications and Dialogic. It put almost \$600 million into content deals — WebMD and CareerBuilder, for example. Is this the company's exit strategy from its core business?

So think about it. What are the issues you see out there? What do you think is driving the industry? ▀

ALAN F. WESTIN

Personal data for 'freebies' — is this a fair bargain?

ARE CONSUMERS making a Faustian bargain by trading personal information for discounts and Web freebies? While privacy advocates and Web companies debate, consumers have already reached an unusually clear consensus: They don't mind providing private data if the companies follow good privacy policies.

What's at stake is how online privacy choices are structured and the future of e-commerce.

On one side are the computer, Web service and e-commerce companies that see personal data as vital to developing effective and responsive e-commerce. They ask Internet users to provide information about their interests and demographics or to allow data about their site visits to be collected for statistical analysis. In return, Internet users are offered a variety of "freebies" — free e-mail, home pages, product discounts, sweepstakes opportunities or even free PCs. Millions of people have chosen to

participate in these online information-for-rewards programs.

On the other side are some privacy advocates who denounce these programs as a dangerous threat to online privacy. They warn that highly personal profiles could be created by these information-for-benefits programs and that this information could be passed along to other companies or even seized by government investigators.

So just how do people who use the Internet react to this controversy? A national survey of Net users conducted in February that was recently released by Opinion Research Corp. for the bi-monthly newsletter I publish, "Privacy & American Business," reveals that privacy advocates are speaking for only 12% of the adult Net user population.

The survey shows that 86% of Net users reject the idea that trading information for benefits constitutes a careless relinquishment of privacy or threatens the creation of a good privacy environment on the Net.

These people feel that trading information for benefits is a fair exchange.

The survey asked respondents whether they felt three specific information uses were fair or unfair to consumers. Nine out of 10 said it's fair to collect information about consumer interests and preferences and use this only for statistical analysis. Eight out of 10 said it's fair for those receiving benefits to accept banner-type ads for products and services on their free PCs or on the Web sites they visit. And six out of 10 said it's fair for people getting a benefit to agree that their e-mail addresses be provided to reputable companies so those companies can send offers that reflect a person's particular interests.

At the same time, we found, as have dozens of other surveys of Net users, that privacy policies *do matter* when individuals are asked to give personal information at Web sites.

A majority of Net users (53%) said they might participate at some time in this kind of Internet program if they were provided a full explanation of how their information would be used. This percentage represents approximately 46 million potential participants.

And, in deciding whether to join such a program, a resounding 82% of adult Net users said having privacy policies would matter. Only 14% said such policies would not be important as long as they got the benefit.

But in the larger privacy debates, telling individuals about how their information will be used is only half of the good-practices formula. The other half is providing opt-outs or tailored choices that allow people to accept some uses as fair and decline others they feel are not acceptable.

The message of the P&AB survey to e-commerce executives and Internet task forces is clear: Internet users are ready to join a key component of the consensual e-marketing model — if business Web sites do it the right way. If sites post and follow good privacy policies, consumers will come, carrying personal information. Violate the promises, and they will leave. ▀



ALAN F. WESTIN is professor emeritus of public law and government at Columbia University and publisher of "Privacy & American Business." Contact him at pab@idt.net.



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BUSINESS

FACES OF Y2K

Who are the people shouldering the real work of staving off Y2K disasters? Our photo essay pays homage to some as the countdown continues. ▶ 57

HIRING TIPS

Hiring the right person means knowing what questions to ask and what not to ask. IT managers share their tips on what those questions are, plus clues that can offer insight into your next job candidate. ▶ 52

LOOK WITHIN

Non-IT staffers who already work for your company may have the organizational, communication, analytical and creative skills to fill the critical vacancies you have in your IT departments. ▶ 55

GET PERSONAL

The way things are developing online, e-commerce sites will have to perfect personalization to the point that they serve more as interfaces to entire supply chains than they do as stores, Peter G. W. Keen predicts. ▶ 48

SCHWAB ONLINE

Even if it is a Web business, Charles Schwab's e-commerce unit must be a buttoned-down place to work, right? Nope. It's a high-energy Web environment peopled by the same body-pierced, technophilic types you find in Silicon Valley, according to its vice president. ▶ 66

PATENT PUSH

The U.S. Patent Office is increasing the number of examiners that it has checking Web-based patent claims. The office is looking for people with good technical knowledge who also understand issues surrounding new business models. ▶ 42

DECENT DATA

Two manufacturers are discovering that moving to ERP from low-tech process planning requires a heavy emphasis on retraining users, many of whom may not realize how important good data is for a company that relies on it to make production plans. ▶ 44

LICENSE LIMITS

Software licenses often include language that limits the amount of time you can use the product, Joe Auer warns. He recommends requiring vendors to make licenses perpetual and irrevocable even before you decide which vendor to hire. ▶ 66

QUICKSTUDY

Companies organized as virtual corporations can take many forms. But any way you slice it, the virtuality can cut costs and increase productivity if the IT infrastructure is strong enough to provide good channels of communication. ▶ 64

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RECRUITER MICHELLE GORMAN says it can take months to find good e-commerce and security candidates

HEDGING YOUR CAREER BETS?

COMPUTERWORLD visited with information technology recruiters and found out what the hardest-to-fill jobs are as we head into the next millennium. What are the best bets on where the chips are going to fall? The recruiters say that skills in customer relationship management, project management, database administration, e-commerce architecture and others will garner top dollars and training.

50

States Turn to Outsourcing On Web for Agency Records

Revenue-sharing model in Virginia will fund Web sites for other state agencies

BY PATRICK THIBODEAU

IN VIRGINIA, when a law firm or insurance company needs a motor vehicle record, it gets it via a Web site for \$5 or requests it via the telephone or in person for \$6.

The difference in price and convenience helps to steer traffic to Virginia's Department of Motor Vehicles' (DMV) Web site. But the sale of motor vehicle records over the Web also generates business for Virginia Interactive LLC in Richmond, which gets \$1 of every \$5 spent on motor vehicle records purchased on the Web.

Give and Take

Virginia Interactive expects to see more than \$3 million annually in revenue from this Web-based system with the DMV next year, after the first year of the project is complete. In exchange, the company is under contract with the state to use the money to provide Web hosting, maintenance and design services for a long list of other state agencies, boards and commissions.

Virginia is one of nine states

that have outsourced Web services in similar revenue-sharing agreements. Virginia Interactive's parent company, the National Information Consortium Inc. (NIC) in Overland Park, Kan., earned about \$38 million last year.

Competition

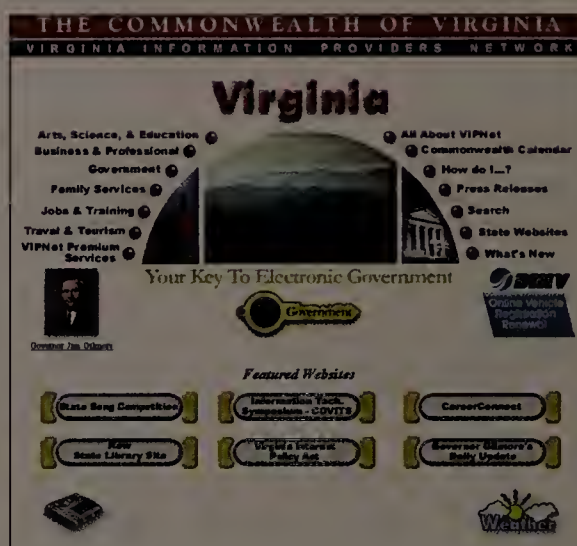
NIC is aiming its services at government, which has a hard time competing with private firms for Web developers but is also under pressure to put records and services online.

But under this revenue-

sharing arrangement, the cost of records for end users can rise in some cases.

For instance, when Virginia increased its motor vehicle records charges from \$4 to \$5, some of the large-volume users, mainly companies that gather information for insurers, complained about the increase, said Karen Chappell, director of information and legislative services at Virginia's DMV.

Moreover, Chappell said the Commonwealth's agreement hasn't re-



OUTSOURCING FIRM Virginia Interactive gets \$1 from each \$5 motor vehicle record obtained through the Virginia Department of Motor Vehicles Web site

Web developers. The department, which has been offering

records online since the 1970s, prefers to maintain its own Web site. "We don't want to be put in a queue with [Virginia Interactive's] other customers," said Chappell. The state's arrangement will probably offer the most benefit to other Virginia state agencies that were behind in their Web efforts, she added, allowing NIC to maintain control of their sites.

Other states such as Kentucky are outsourcing smaller parts of the Web effort, for instance, Web hosting and electronic payments, while centralizing control of Web development. "We are trying to do the same thing internally, by promoting enterprisewide investment," said Doug Robinson, executive director at Kentucky's Information

Management Resources Commission. ▀

Fed Seeks More Examiners for Net Patents

Tech/business skills combo needed to handle onslaught

BY JULIA KING

Responding to a surge in new applications for Internet-related patents, the U.S. Patent and Trademark Office and U.S. Copyright Office has hired nearly a dozen new patent examiners with both computer science and specialized industry expertise.

Despite criticism about its treatment of e-commerce, the Patent Office is also standing behind the 125 or so patents it granted last year for supposedly new ways of doing business on the Internet.

In the past 18 months, the agency has come under fire by critics who claim it's awarding too many new Internet patents for ways of doing business that are neither new nor novel except that they're executed in cyberspace [News, Aug. 23].

But that, according to Patent Office Deputy Director Brigid Quinn, is often good enough to warrant the monopoly protection of a patent, because

patents aren't reserved solely for new inventions, as many people believe.

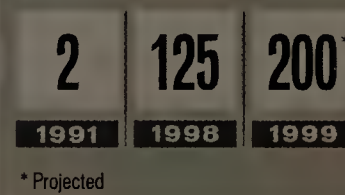
"Patents are [granted] for improvements, too," Quinn said. Rejecting Internet-related processes such as Priceline.com Inc.'s patent for reverse auctions would be "like saying Henry Ford shouldn't have gotten a patent for the automobile because we already had a horse and buggy with wheels that moved you forward," she said.

Prior Inventions

One of the primary criticisms leveled at the Patent Office is its alleged cursory searches of so-called "prior art," or previous inventions and/or research that might invalidate a patent application. To ensure that applications are scrutinized thoroughly from both business and technical standpoints, the Patent Office is recruiting examiners who hold computer science degrees and a second degree or work experience in business disciplines, such as marketing or finance. This year, the Patent Office has hired 11 new examiners to review applications for Internet-related business

Internet Patents On the Rise

Number of Internet-related patents issued:



SOURCE: U.S. PATENT AND TRADEMARK OFFICE, WASHINGTON

methods, which brings the total number of examiners in this area to 39. Another four examiners are due to be hired by year's end.

"The increased filings and the subject matter being addressed is what's driving this," said Joseph Rolla, director of the group.

For example, a patent application for an electronic-billing method might be reviewed by someone with both a computer science degree and a degree or work experience in finance and accounting, Rolla said.

To attract new examiners, who earn from \$40,000 to just a little over \$100,000 per year at the highest job grade level,

the agency is offering to start new examiners at higher job grade levels than before and to advance them more quickly through the government pay schedule.

"The primary weakness is that the [Patent Office] is going through a real big growth spurt, particularly in the examination of computer-related patents," said Mike Smith, who worked as a software patent examiner from 1998 to 1999 and is now a patent attorney in Minneapolis.

Typically, an examiner has four days to read a patent [application], conduct a search and write an initial rejection, Smith said.

In addition to its load of new applications, the Patent Office re-examines about 350 patents per year — many because of disputes about their validity.

Kevin Spivak, another former patent examiner now working as a patent attorney in Washington, points to the sheer novelty of Internet technology in general.


"The problem with Internet [patents] is not so much that [the Patent Office is] not digging up prior art, but that there's nothing to dig up," Spivak said. "It's a stretch to say they're not doing their job." ▀

SNAPSHOT

Sticky Sites

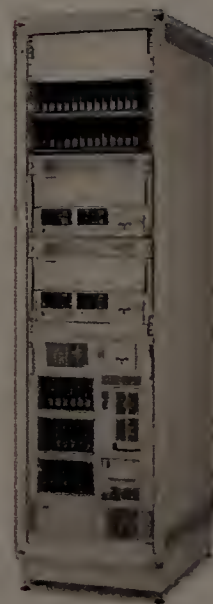
Top 10 Internet sites ranked by average minutes per user per month:

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ETrade	66.5
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Clean ERP Data Poses Challenge for Manufacturer

Moving to detailed production planning means teaching workers about careful counts

BY CRAIG STEDMAN

PREPARING end users for the rigors of working with ERP applications is almost always a challenge. Now imagine that they're starting from scratch, with no real prior systems experience.

That's the position Acushnet Co. is in. Acushnet, a Fairhaven, Mass.-based maker of golf equipment, used a combination of spreadsheets and manual procedures to manage its five manufacturing plants before it began to roll out PeopleSoft Inc.'s enterprise resource planning (ERP) software in June.

"We had no manufacturing system," said Peg Nicholson, Acushnet's CIO. Production and inventory planning were done only "at very broad brush-stroke levels," which meant plant-floor workers didn't have to sweat the details when they counted the different types of golf balls being made, she said.

Now the company is starting to use applications from Pleasanton, Calif.-based PeopleSoft to do more serious planning. But if the workers in the plants don't put in accurate data, "the system is going to give [us] garbage results," Nicholson said.

Acushnet's project steering commit-

tee realized early on that training the 350 workers who are expected to use the ERP system wouldn't be simple, said Bill Frye, a plant manager who is leading the manufacturing rollout.

To try to help workers understand the basic workings of an ERP system, the project team created informational posters and written quizzes that featured gift certificates to local stores as a reward for their efforts, Frye said.

Employees also got at least a week's worth of training split into two classes — one on how to use the software, the other on the need to be disciplined so bad data doesn't get into the system and spread throughout the company.

Keeping the Ball Rolling

The ERP software is now running at two Titleist golf ball plants and is scheduled to be turned on at two more sites next month. Acushnet's golf club plant should follow by early next year. Expected benefits include inventory savings and the ability to create production schedules that are more precise and can be changed on the fly.

But instilling the required discipline "has been a real challenge, and it's still a challenge," Frye said.

To plant workers, the amount of balls made during a production run "may seem like just a number," he added. "But it feeds up into this integrated monster that plans our schedules and buys our materials."

At the first two plants, production

JUST THE FACTS

Teeing Up With PeopleSoft

ACUSHNET CO.

Headquarters: Fairhaven, Mass.

Parent company: Fortune Brands Inc., Old Greenwich, Conn.

Employees: 4,000; 350 PeopleSoft users

Main products: Titleist golf balls and clubs; Cobra golf clubs; FootJoy golf, dress and athletic shoes

Status of PeopleSoft project: Corporate human resources system is live; financial and manufacturing applications are running in two plants and being installed at three more

supervisors are now going out on the floor to help coach workers on the importance of entering good data into the system, Frye said.

Incentives

Employee bonuses are also being tied to things such as accurate inventories. "You keep hammering the theme in every way you can," Nicholson said. Data accuracy has improved sharply at the two golf ball plants since June, "but it probably won't be exactly where we want it to be for another six months," she added.

Dean Brown, a consultant at Houston-based software training firm D A Consulting Group Inc., said showing end users how quickly inaccurate data can spread through an ERP system should be a prominent part of any training program.

"The ripples are just amazing," Brown said. "In the past, you could isolate mistakes pretty easily because you had time to track them down. Now you don't." ▀

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Training Is Key to R/3 Success

Training workers on the intricacies of using an ERP system has also been a big hurdle for Storopack Inc., a maker of polystyrene packaging materials that finished a U.S. rollout of SAP AG's R/3 applications in March.

Storopack gave its 60 R/3 end users about 100 hours of training during a three-month period before going live, according to Kirk Wilhelm, the company's SAP project manager.

For the workers, especially a group that had been using a 20-year-old mainframe application, R/3 requires "a different way of thinking" about how to enter orders and run other basic business transactions, he said. "It was a huge training process."

Further complicating matters was an internal reorganization that tied Storopack's German parent company together more tightly on a global basis, resulting in more business process changes than the ERP system forced on its own. For example, workers

in the U.S. now have to process shipments to other countries.

The R/3 training was broken into small chunks, such as how to process a customer order, to make it easier to digest.

But Storopack still has "more garbage-in problems than we'd like to see," Wilhelm said.

To try to improve the accuracy of the information in the ERP system, Storopack — which is getting consulting help from Siemens Business Services LLC in Burlington, Mass. — plans to build new data-validation rules into its R/3 configuration.

The rules will check for errors in data entry codes, which originally were "left a little loose just so we could get started" with the SAP rollout, Wilhelm said.

It will also mean more training to show users what they can't do anymore, he added.

— Craig Stedman

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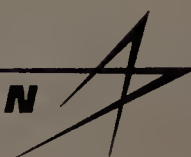
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Point of View

Windows 2000 makes life more manageable for IT professionals

Microsoft is including technologies in the upcoming Professional and Server editions of Windows 2000 that will further centralize management of heterogeneous networks of clients and servers. For the first time, the company will ship its Active Directory, providing a central point of control for resources like computers, data and applications on a network.

Microsoft will also lay out a framework for a new data exchange format, Windows Management Instrumentation, when the server-class operating system ships later this year. The goal of the new utilities is to work with Microsoft's existing management software to ease management of desktops.

"When you look at the cost buckets of an IT organization, the biggest cost comes from managing desktops," says Craig Beilinson, lead product manager for Windows 2000.

"There's installing the software and drivers, setting security and policies and controlling whether a person can or cannot change the color of their toolbar or wallpaper. Active Directory and the Windows Installer Service go a long way to reducing the costs and locking down the desktop, while still providing users with the

flexibility needed to get their jobs done," he says.

Compaq Computer is taking full advantage of the new management framework with Windows 2000-specific tools for Compaq's systems. The hardware vendor has created Systems Software Manager (SSM), a tool for automatically updating hardware and network drivers on a fleet of Compaq Deskpro systems. One of the largest hassles of migrating to a new operating system is updating the device drivers to allow printers, drives and other third-party devices to talk to the new operating system.

SSM works by creating a file store of the optimal drivers for Windows 2000 and storing them on a server. IT administrators can either automatically or manually update the drivers on a whole network of PCs using e-mail or a log-in script. The SSM utility works in conjunction with Compaq's Insight Manager LC, which detects what version of a driver is running on a PC's hard drive and provides the information to SSM, which can automatically replace outdated drivers.

For more on Active Directory and other Windows 2000 management features, visit www.WindowsNT-Advantage.com.

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SPECIAL ADVERTISING SECTION

Windows NT

Reliability & the Bottom Line

Robustness,
functionality
and ease of use
are essential to
business success



By Philip Kay

In show biz, there is no such thing as downtime. If the juggler is a no-show, the stand-in had better be ready. Because once the curtain goes up, the show must go on.

The same thing is true in IT shops today. If a system crashes, a company had better have a stand-in — or suffer the consequences. What's more, IT's stand-ins have to be ready 24 hours a day, seven days a week, 365 days a year. No one can afford to drop the ball: the explosion of the Internet and, perhaps more importantly, the rise of e-commerce have made sure of that.

Take Web auctioneer eBay Inc., for example. One infamous 22-hour outage cost the company more than \$3 million in revenue, wiped billions off its share price, and even worse, caused it to lose business to rival auction sites.

"I call it the over-and-out scenario," says Dave Hill, a senior analyst at Aberdeen Group in Boston. "These days an outage can kill a company, and then it's over and out forever."

So reliability in the enterprise isn't just another sales gimmick. It's a must. And now, even a standard \$2,000 Windows NT workstation must be as reliable as a million-dollar mainframe.

There are several ways to approach reliability. Research is forging new technology to make systems run faster and more efficiently. Several companies, including Compaq, IBM, Cisco and Hewlett-Packard, have joined forces to create the new PCI-X standard, also known as "Future I/O," that will more than double the rate at which data travels to and from a server.

Continuously under development are efforts such as Compaq Insight Manager management software. And there is an increasingly important role played by services and support such as those provided by Compaq Services Division.

A commitment to reliability means emphasizing the planning or architecture of the system, according to Tom Iannotti, vice president of Compaq Services Division.

"Compaq Services Division offers the preventative medicine of computing," he says. "The organization will take the customer by the hand and assist them in the design and implementation of the system and the training of key system administration staff."

For more keys to reliability, visit www.WindowsNT-Advantage.com.

Advantage

The Strategic Information
Magazine for IT Leaders

Brent Harman: Ultimate Windows 2000 insider

Brent Harman is Senior Operating Environment Architect for Compaq Information Management. He is also Program Manager for Compaq's Windows 2000 Joint Development Project with Microsoft. In the latter role, he and his team have worked intimately with Microsoft on the development of Windows 2000. At the same time, they have been developing an internal Windows 2000 implementation at Compaq that will be rolled out to some 1,000 users by mid-October. Through the efforts of Harman and his team, Compaq has gained a substantial competitive advantage in the Windows 2000 marketplace.

Windows NT Advantage News Editor Bruce Hoard recently talked with Harman:

NTA: What are the biggest problems you've faced, and how have you overcome them?

Harman: I would say the most significant problem is that Microsoft originally viewed Windows 2000 as an update to NT 4. Compaq didn't view it that way for several reasons. Compaq had its own NT 4 environment, then we acquired Tandem, which had its own NT 4 environment, and then we acquired Digital, which had its own NT 4 environment. There was no way to bring those environments together short of just doing it by hand, one at a time, which was really not an option. So we began to view Windows 2000 not as an upgrade, but as a migration. We began to view it as an opportunity to clean up our NT 4 environment and take advantage of all the things that would be in Windows 2000.

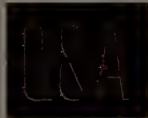
NTA: Did the other larger enterprise companies feel the same way as Compaq?

Harman: Most of them viewed the move to Windows 2000 exactly the same way as Compaq did — as a migration, rather than an upgrade. And I think that was the largest hurdle that we had to overcome because it meant that Microsoft had to go back and rethink a lot of things that they intended to do, because all of their enterprise customers were coming back and saying, "Now wait a second. There is a whole new group of tools that we have to have." I guess we can take the hit for delaying the launch of their product for maybe as much as a year. That's how responsive they've been.

NTA: What are the primary advantages of Windows 2000 over NT?

Harman: I think No. 1 is the concept of directories. Not a lot of people understand why they would want a directory service. Compaq was a user for more than a decade of Banyan Vines, which was one of the early operating systems that had a directory service. So we became early converts of the concept of directories. When Banyan was no longer able to

keep up, we made the decision to move to Windows NT, but we have always understood the benefits that come with a directory service. They allow you to have one place where you store user information so you don't have to worry about duplicate names. And you have one place to find objects, one place to manage. As a result, you don't have to spread yourself thin over many domains.



NTA: What other advantages are there?

Harman: It also gives us the opportunity for the first time to require certain behaviors on the network. For example, we

have a policy at Compaq that requires any user — whether they are logging on inside the company, or dialing in remotely — to be running real-time virus scanning software. Under NT 4 there is no way to enforce that. With Windows 2000, we will be able to enforce it.

NTA: Are there any other advantages of Windows 2000 over NT?

Harman: The third thing is that we will have much better control over the client machine. The client will be easier to administer. Delivering applications will also be easier. This will drastically reduce our administrative overhead. There is also no question that Windows 2000 is by far the most superior portable operating system today. It is just more reliable, it's more solid, and even though portable users may not always be connected, we have other means to keep them current.

For the full text of this interview, including information on other Windows 2000 beta-test companies, visit www.WindowsNT-Advantage.com.

"We began to view Windows 2000 not as an upgrade, but as a migration."

— Brent Harman,
Compaq Information
Management

Online This Week

Updating PCs: Staying in control of change in the enterprise

◆ Updating a PC can be a painful task, but Compaq is making it a bit easier. The company is offering a service that helps its customers decide which changes they need and which ones they can let slide.

Read more about change management in the Web Magazine *Windows NT Advantage* at www.WindowsNT-Advantage.com.

Windows NT plays starring role on the silver screen

◆ The power of Windows NT combined with increasingly powerful and cheaper hardware have made NT the choice for more and more post-production multimedia work.

Read more about NT's influence on the movie-making industry in the Web Magazine *Windows NT Advantage* at www.WindowsNT-Advantage.com.

Retaining high-tech workers: What's your strategy for success?

◆ With restless dot-com cowboys itching to head out to the Internet frontier, it's never been harder to maintain a qualified IT staff.

For tips on employee retention, check out the Web Magazine *Windows NT Advantage* at www.WindowsNT-Advantage.com.

Quickpoll

Do you support an increase in visas this year to help fill jobs in high tech?

◆ GOP leaders want to up the visa quota this year (from 115,000 to 200,000) to help U.S. companies fill high-tech jobs. The labor shortage is real, but the proposal is controversial — businesses want it; labor groups don't.

Cast your vote now at

www.WindowsNT-Advantage.com

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BRIEFS

Satisfied
E-Customers

Overall satisfaction among people who buy products online is high, in spite of some customer-service and delivery problems, according to a study by Dataquest, a unit of Gartner Information Group Inc.

Of 505 households surveyed, 88% said they were satisfied with their online purchasing experiences. Those surveyed said they were pleased with the ease of placing orders and making reservations, San Jose-based Dataquest said. Out of an estimated 37 million U.S. homes with Internet access, one-third had at least one person who placed an order or made a reservation online from February to April, Dataquest said. Of these, Dataquest estimated 2.4 million had experienced problems such as being billed for orders that never arrived.

Yahoo Bill Service

Yahoo Inc. in Santa Clara, Calif., has announced a new service that lets registered customers pay their bills online. Yahoo is offering the service through an agreement with CheckFree Corp., which automatically debits users' bank accounts for bills they designate for electronic payment. CheckFree guarantees customers protection

against fraudulent transactions by limiting any customer liability to \$50. After a three-month free trial period, the cost of the service ranges from \$2 to \$7 per month plus a per-bill fee of 40 cents.

FAA Audits Y2K

The Federal Aviation Administration (FAA) has announced that it has hired Primeon Inc., a Burlington, Mass.-based provider of application re-engineering services, to conduct year 2000 audit services. Under the deal, Primeon is checking the FAA's mission-critical systems to make sure they have been properly remediated to handle the year 2000 date rollover.

Kick Tires Online

America Online Inc. has announced it will create a service that will allow shoppers to test-drive new products such as DVD players and stereo systems online. Under an agreement with e-Sim Ltd., a flight-simulation technology company, AOL will offer the e-Sim LiveProducts service at its Shop@AOL marketplace. Available this fall, LiveProducts will let users learn how to use products before buying them. For example, a user could try out a simulated version of a digital phone by clicking his mouse on the phone keypad.

SNAPSHOT

Follow the Money

Venture capital investments in software companies in 1998, by category of software:

Internet	\$324M
Enterprise	\$212M
Vertical-market	\$152M
Systems	\$89M
Productivity	\$71M
Programming languages and tools	\$62M
Education/entertainment	\$35M
Other/not categorized	\$7M

GRAPHIC BY PETER W. EPHRAIM/COOPERS SAN JOSE

E-commerce: Chapter 2

PETER G. W. KEEN

IN THE FIRST CHAPTER of the e-commerce storybook, the technology largely drove business models. Now the business models are driving technology. Post-2000, this will transform the part of IT organizations that has been least affected by the Internet: business application development.

Chapter 1 of e-commerce exploited three technology enablers: the Web browser, hypertext and Internet Protocol networks. C++ and Java were the base for front-end applications, with application program interfaces (API) linking to back-end databases and processing systems. This gave us the standard storefront and shopping approach to online business. Customers log on to a site, where they interact with a growing range of services.

Very quickly, it became apparent that the keys to all aspects of Internet business are customization, personalization and relationship-building. Prices dropped as customers surfed, and online players began to give away freebies to help build the relationship: e-mail, Internet access, research, news articles and even PCs.

In this context, building repeat business and relationships set the stage for Chapter 2: the move to maximum personalization. This movement began with "cookies" and continued with giving viewers the ability to customize Web sites. Personalization became the basis of the portal player strategy: Build a relationship brand so customers park at your site to explore the Web, the way shoppers park at Wal-Mart and then shop the rest of the mall.

The Web storefront surf/shop approach is now moving to a Net market/dynamic agent strategy. The service provider generates offers, scanning the Web to put together deals. Pricing changes from the stated price to the right price for you. There is on-the-fly communication among sites about inventories, status, prices, catalogs and specials. It's like having a personal broker working on your behalf, who contacts you with "Boy, do I have a deal just for you!"

This business model turns the Web into a market of tightly linked supply chains. Chapter 2 Web strategies include industry portals that bring together all the players needed to configure and price unique, dynamic offers to customers; consumer portals that are the trusted single contact point for just about anything; and vertical portals, infomediaries and other variants of no-site-is-an-island online business.

So behind the customized front ends to their

online business services, Dell's and Schwab's sites interact directly with many others, using software tools, catalogs, APIs and links to legacy systems and databases. Amazon's acquisitions are as likely to be a software company providing software for customization and dynamic offers to customers as they are to be firms that add to Amazon's range of goods.

This business model needs a new generation of technology. The market is responding very fast. In just a few months, the moves to apps-on-tap and software-on-demand have created the likely next software industry: application software providers. Java has enabled a mass of front-end customization tools, while Jini (basically Java for hardware devices by connecting through IP) makes the most dynamic and interactive of personal tools — digital cell phones — part of the IP/Java world.

Such innovations as Hewlett-Packard's Chai, a new Java-based development language, illustrate the shift toward what HP calls "e-speak" applications talking to other applications and brokering services. This style of interactive, dynamic agent is clearly the emerging norm for software targeted at customer relationships.

Most of this new technology leaves me feeling like a goldfish floating in a bowl of alphabet soup. I wash up against acronyms as alien to me as most of standard IT is to businesspeople. What's very clear to me, though, is that the relationship imperatives and customization that underlie Chapter 2 business models are driving all this new technology. In turn, this new technology is the basic tool kit that IT organizations must use to develop business applications

once they get through Y2K and all those lengthy ERP implementations. The pace and force of these business model demands are already so strong that they will push the demand for electronic-services technologies even faster.

IT will have to respond. Now, does anyone have a Chai or Jini manual? ▀

Keen can be contacted at peter@peterkeen.com. His new (co-authored) book, *Electronic Commerce Relationships: Trust by Design*, will be published late this year by Prentice Hall.

Now business
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THE ONLY THING MORE OVERWHELMING THAN NEW TECHNOLOGY


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JOB SEEKERS' BEST B

Pondering a new job and salary opportunity? It pays to know which jobs are the hardest to fill. Here's a look at the ones recruiters really struggle with By Deborah Radcliff

CRM IS HOT. ERP is not. Web page developers are out. Web architects are in. Keeping abreast of the hottest skills sought by information technology employers isn't easy. That's why *Computerworld* recently spoke with several technical recruiters to determine just which skills are most in demand heading into the next millennium.

To fill these jobs, hiring managers are willing to pay top dollar. They're also willing to sponsor thousands of dollars in continuing education to keep these skills in-house.

Here's a look at what recruiters say are currently the hardest IT jobs to fill:

Customer Relationship Mgmt.

Salary Range: \$65,000 (six months' experience) to \$125,000 (one-plus years' experience, with project leadership)

"Customer relationship management is about to blow through the roof," says David Cohn, senior staffing specialist at RSA Consulting Services in Englewood, Colo. "The goal is to tie the e-sales and e-marketing applications to the ERP systems we've already implemented."

Customer relationship management (CRM) tools further integrate sales, marketing and customer service organizations to unite resellers, service providers, businesses and customers into a single information system. As a result, technologists experienced in implementing leading CRM products like those from Siebel Systems Inc. in San Mateo, Calif., and Clarify Inc. in San Jose can expect to earn what their enterprise resource planning (ERP) predecessors earned last year, adds Cohn.

How hard are such skills to find? In June, RSA began a search for 10 experienced CRM specialists to staff a new con-

sulting unit. By the middle of last month, the company had hired one and was preparing offers for two more.

"We've done some very creative things to find people who are skilled with CRM implementations," says Rob Quinn, West Coast recruiting director at Management Consulting Services. "We rely heavily on referrals."

We even bring in foreign nationals because these packages are being implemented in Europe and Asia."

Related skills in automated-chain implementation are also hard to find. During the next year, Cohn predicts a strong demand for specialists in software from Manugistics Inc. in Rockville, Md., and I2 Technologies Inc. in Irving, Texas. He says he anticipates an even stronger demand for those who can integrate these packages with other office-automation systems.

E-Commerce Architects

Salary Range: \$100,000 to \$130,000, depending on experience

Many of today's ERP, supply-chain and CRM management projects cross into e-commerce, calling for an integrated set of Web application development

and integration skills, say technical recruiters.

Most technologists get into e-commerce architecture by means of Web-page development, then Web-page design. The specific supporting skills they need include C++, Java,

JavaScript, Oracle and Perl. Employers are seeking senior-level architectural skills mixed with

business savvy.

For the past three months, Phoenix-based IT consulting firm Sprint Paranet has had 20 open positions for e-commerce architects in its western division alone. Michelle Gorman, recruiter, says she hopes to find project leadership experience that demonstrates the candidate can align technology with strategic business needs.

Java/Object-Oriented Engineers

Salary Range: \$85,000 (one to two years' Java development, with C, C++ background) to \$150,000 (three-plus years' Java development, with project leadership experience)

Speaking of Java (and most employers are), demand for skills in this area is getting hotter every day. "A good, experienced Java person is hard to find, especially those who can actually say, 'I've got three

HIRING

ETS



DAN COOGAN

The candidate had all the right buzzwords, but he also knew enough to explain the business value of his implementations.

MICHELLE GORMAN,
RECRUITER,
WESTERN DIVISION,
SPRINT PARANET

years working with Java," says John Wagner, senior technical recruiter at Sykes Enterprises Inc., a Raleigh, N.C., call center management outsourcer.

Senior-level Java experts build business applications for telecommunications, engineering and financial-tracking software, Wagner says. But because experience is so hard to find, his company has placed 10 lower-level Java programmers with one year of Java experience and C backgrounds, while finding only one senior Java developer during the same period.

"Start as a junior programmer, and if you're good, within six months you'll be developing Java applications. For every six months' experience you get in Java, your pay will increase exponentially," Wagner says.

Network and Systems Engineers

Salary Range: \$75,000 to \$100,000, depending on experience and project management background

Three years' experience is the magic number for hiring managers. This shows you not only know a technology, but you also know how it relates to the business application it serves. Employers are also hurting for network and systems engineers with, yes, three to six years of experience.

But these people are a little easier to find than experienced Java folks. Wagner has placed five systems engineers and seven network engineers in the past six months. These candidates must be skilled in routers, hubs, modems, switches, network design, electrical engineering and software that manage traffic flow.

"Systems and network engineers will continue to be in high demand as long as businesses rely on networks," Wagner says. "We need system engineers to design, build and maintain networks. We always need people to make them faster, expandable and more reliable."

Network and systems engineers usually start in desktop configuration, then specialize in operating systems, network administration, network management or network redesign and then, with training as a Cisco Certified Networking Associate or Microsoft Certified System Engineer, graduate to the engineering level.

Information Security Specialists

Salary Range: \$70,000 to \$110,000 (Based on SANS Institute System, Network and Security Administration Salary Survey)

Some network administrators move into information

security. But not nearly enough, say hiring experts.

"Data security is an awful position to fill," says Monica Beliczky, technical recruiter at \$6 billion Altell Corp. in Little Rock, Ark. Over a three-month period starting in May, the telephone software and services company made four offers to fill one asset-protection analyst position. Beliczky found that person, but she had to settle for someone who needed significant training.

Sprint Paranet also finds it extremely frustrating to fill the 40 to 50 Certified Information Security Specialists positions that open up annually.

"We need people who can identify security threats, calculate risk analysis for our clients' current systems and architectures, implement firewalls, intrusion detection and other security technologies," Gorman says. "It takes me the better part of four months to find one of these people."

Database Administrators

(Other than Oracle)

Salary Range: \$45,000 (entry-level analyst) to \$91,000 (senior architects)

Certain flavors of database administrators are also difficult to find. For more than a year, Beliczky searched for an

IBM DB2 administrator. She says she had no luck because most candidates would rather work on Oracle, which involves skills that are much easier to find. In August, she gave up and canceled the position.

"Candidates are not qualified, not interested in IBM or want to work as contractors only," Beliczky says. Most of the work involves database installation, upgrades and application integration. A traditional path to database administration would be through operating system programming.

Client/Server Developers and Architects

Salary Range: \$38,500 (entry-level client/server developer analyst) to \$84,000 (senior client/server architect)

Employers also find it hard to hire people with that magical three to four years' experience in client/server technology — those C++ developers who can tie together relational databases (Oracle, Informix) and Unix operating systems.

Altell relies on a variety of hiring methods — promoting and training internal candidates, college recruiting, job fairs, the Internet, cross-training Cobol programmers to C++ and hiring foreign nationals under the H-1B visa program.

The mixed bag of recruiting efforts seems to be working. Beliczky recently filled an open client/server development position in a month. She has 10 more open positions, to which she's getting some favorable responses. She's even finding some candidates for the higher-level positions.

Project Managers

Salary Range: \$80,000 to \$140,000, depending on experience and complexity/type of projects worked on

Across the board, hiring managers say finding folks to lead their IT projects — whether it be network architecture, electronic procurement or data warehousing — is, indeed, the most difficult.

"We're very specific about what we need in our project managers — staffing, planning and the ability to deal directly with executive-level management at our client side," says Quinn. "In addition to a true understanding of the specific technology being implemented, we need client management skill, the ability to plan, staff and deal directly with executive-level management at our clients' [level]."

Radcliff is a freelance writer in Northern California.

THE ART OF THE HIRING INTERVIEW

Want to hire the right person? You've got to ask the right questions, stop asking the wrong ones and watch for clues
By Alan S. Horowitz

AN INFORMATION technology department without good people is no more effective than an Internet connection with severe bandwidth problems — neither will ever live up to its potential.

The gateway to connecting with the people you need is the hiring interview. It's where vital information is revealed and analyzed, and it's an opportunity that is missed only at a high cost to your department.

The interview is more than a careful approach to asking the right questions. An IT manager wants to look for nonverbal cues and aspects of a prospec-



KEN HILL at General Dynamics likes this in-your-face question: "Why aren't you making more money?"

tive hire that may not be immediately apparent. Here's how some IT managers use the interview to their best advantage in screening job candidates:

1. Favorite questions: Steve Brillling says he likes a direct approach. The senior vice president and CIO at Swiss Reinsurance America Corp. in Armonk, N.Y., asks applicants: "Tell me your philosophy; how do you manage people?" For senior-level people, what's important, he says, is how the person approaches people-management issues, not nuts-and-bolts IT expertise, which virtually all senior people have.

Bud Albers, senior director of technology services at St. Louis-based Monsanto Co., will ask things like: "Where do you think the business will be in two years, five years and 10 years?" Or, "What will the Web look like from a technical perspective and a business perspective?" He wants to know if potential hires really are thinking about where their profession is going and how they will fit into it.

David Bass says he wants to see how applicants deal with uncomfortable issues. Bass, an IT manager at Time Warner Inc.'s Time Customer Service division in Tampa, Fla., asks applicants to describe projects they have led that resulted in failure. He's looking for an applicant to give a valid reason for the failure and to explain what he could have done to turn the situation around.

"I want them to be able to learn from their mistakes and be more successful in the future," Bass says.

Ken Hill, vice president of IT at General Dynamics Corp.

in Falls Church, Va., says he likes an in-your-face question: "Why aren't you making more money?"

What he wants to find out is whether an applicant will answer with excuses. He says he likes to hear that a person is willing to be paid based on his performance and is therefore willing to take some risk.

2. Questions no longer asked: Albers no longer asks what he calls "obligatory questions" such as, "What are you most proud of?" Applicants "have rote answers for these," he explains.

Jeremy Seligman, vice president and CIO at Frontier Corp. in Rochester, N.Y., says he feels the same way and similarly avoids such questions as, "Tell me about your strengths and weaknesses."

"People are well prepared for this question and generally share a weakness such as 'I work too hard' or 'I'm never satisfied,'" he says. "You never get anything useful out of this kind of question."

Bob Jones, vice president and CIO at Moore Corp., a printing and digital communications company with U.S. headquarters in Lake Forest, Ill., says he used to focus a lot on academics and the applicant's biographical details. Now he just asks for a brief synopsis and usually gets a broad picture of the person in about five minutes.

"If they hit on the high points and finish in a reasonable time, that impresses me," he says.

3. Tip-offs: Nonverbal cues can tip off an interviewer to an applicant's suitability or even how well he might fit



JEREMY SELIGMAN at Frontier Corp. looks for people who are "intellectually curious [and] who have a lifelong commitment to learning"

in at the organization. Bass looks at what he calls the applicant's "presentation," which includes dress, confidence and oral skills.

Confidence in an applicant is important to Alan Cranford, vice president of information systems operations at hospital chain Tenet Healthcare Corp., in Dallas.

"I don't want someone who's a wallflower, who can't articulate their strengths," he explains. "I also don't want someone who's very arrogant. I'm looking for a balance."

Seligman asks what the applicant has read lately. "I'm looking for people who are intellectually curious, who have a lifelong commitment to learning, people who read widely, both fiction and non-fiction," he says.

Eye contact is important, says Honorio Padron, CIO and senior vice president of process engineering at CompUSA Inc. in Dallas.

He says, "If you don't look me in the eye, I have trouble with you, because I want people persons." ■

Horowitz is a freelance writer in Salt Lake City. Contact him at alan@ahorowitz.com.

HIRING

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HIRING YOUR NON-IT WORKERS

When strapped to fill a critical IT vacancy, the answer may lie with the non-IT folks already on board
By Mary Brandel

MARY SCHETTL was home on maternity leave in the fall of 1998 when she got a call from Doug Klein, director of IT, store systems, at Sears, Roebuck and Co. in Hoffman Estates, Ill. At the time, Schettl was a project coordinator in the business operations department at Sears, helping to coordinate the retail giant's point-of-sale activities. Klein asked if she'd like to jump the fence to information technology.

Schettl said yes, and now she is a systems planning consultant for point-of-sale systems.

Since at least the early 1980s, companies have peered into the business ranks to fill IT positions. But just because businesspeople are interested in a technology career doesn't mean they will succeed. They must possess certain aptitudes, such as logic, problem solving and an understanding of methodology and procedure.

How do you find that magic blend? Many IT managers say non-IT people like Schettl tend to possess those qualities.

Operations

Good operations employees are detail-oriented, appreciate procedure and understand

complex systems, says Alan Stein, who runs the Learning Institute at UnitedHealth Group in Hartford, Conn.

"Truly, IS is complex systems, so there's some advantage there," Stein says. He helped create a 15-week IT program for new non-IT hires or current UnitedHealth workers.

Schettl didn't start her career in operations; she has a 10-year background in hotel and restaurant administration. But it's the skills that drove her in those careers that make her effective in IT: communication, coordination and organizational capabilities.

Schettl is the first to acknowledge that she's no programmer. "I don't need to know what a programmer needs to know," she says. "I need to understand how the different systems interface with each other — the store systems, the inventory system, electronic commerce — and how we affect them when we make changes to our system."

That takes good communication. "The business partners have to understand where we stand in terms of design and development," Schettl says.

Even without a degree in computer science, Schettl's

organizational skills — along with her tenacity, pleasant personality, ability to confront people effectively and conscientiousness — will help her IT career, says Klein. She's a prime candidate for becoming a project manager, he says.

Finance

You might also do well to look in finance for IT candidates. "To do well in finance, you have to have a fairly good [grasp of how things are organized], be analytical and solve problems," says Nick Vitalari, executive vice president at The Concours Group, a consultancy in Kingwood, Texas. Plus, he says, people in finance might be familiar with high-level languages such as SAP AG's Advanced Business Application Programming.

Stacy Dennis, information systems project manager at UnitedHealth, hired a Learning Institute graduate who came from a financial reporting background.

He had used tools like Microsoft Access, but more important, he had business knowledge. "He knows what the company sells, and we didn't have to explain generic terms that someone from another line of work might not understand," Dennis says.

Actually, the employee's ability to work with numbers wasn't all that important, Dennis says. "It was his level of responsibility and the fact that he had worked with an Access database that gave him a high level of knowledge of how data relates to the business world."

Legal

A less obvious place to look is in the legal profession. Metamor Technologies Inc., a consulting firm in Chicago, has

run programs to train non-IT workers to become consultants. The best candidates were those with a background in law. "The reason we targeted that profession is that we had hoped, in going through three years of law school, that they had been taught how to think logically," says Marcie Newman, director of human resources at Metamor. "In fact, it looked to be true."

Research

Actually, anybody who can adhere to a rigorous methodology — such as a researcher — may be a good candidate. "I've heard of stories where a lab technician in biotech goes from a lab bench into IT," Vitalari says. "They know how to follow procedures and [that doing] them right or wrong [will lead] to good or bad results."

In comparison, people who come out of a much less structured environment, like marketing, might have a lot more trouble with IT, Newman says.

Clerical

At Metamor, one of the managing consultants started as a receptionist. Such moves aren't unusual, Vitalari says. "If someone is organized, likes to organize things, can structure problems — they may well have the aptitude to move into IT areas," he says. And perhaps he puts it best: "Whether a person makes a good IT person really depends on: are they interested in solving problems, do they have the imagination to think about solutions, do they have some analytical skills, can they approach problems in a structured way and do they have a desire to play around with technology?"

Brandel is a freelance writer in Norfolk, Mass.



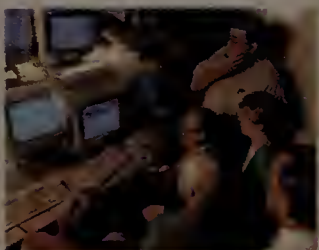
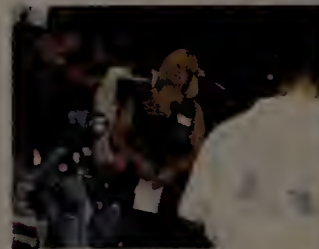
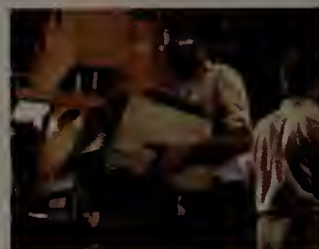
MARY SCHETTL went from project coordinator to systems planning consultant at Sears

What to Look for In a Non-IT Hire

- Logic and analytical capabilities
- Ability to adhere to methodology or procedures
- Structured problem-solving skills
- Business understanding
- Good communications skills
- Organizational skills
- Ability to deal with complex systems
- Creative problem-solving skills

THE Faces OF

Y2K



They've labored in the shadows for years: replacing and testing, planning and preparing. With 110 days to go before Jan. 1, we take time out to spotlight and honor the IT professionals, managers and everyday people who are devoting a large part of their lives to the Y2K problem

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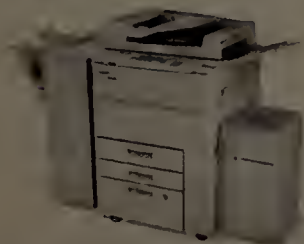


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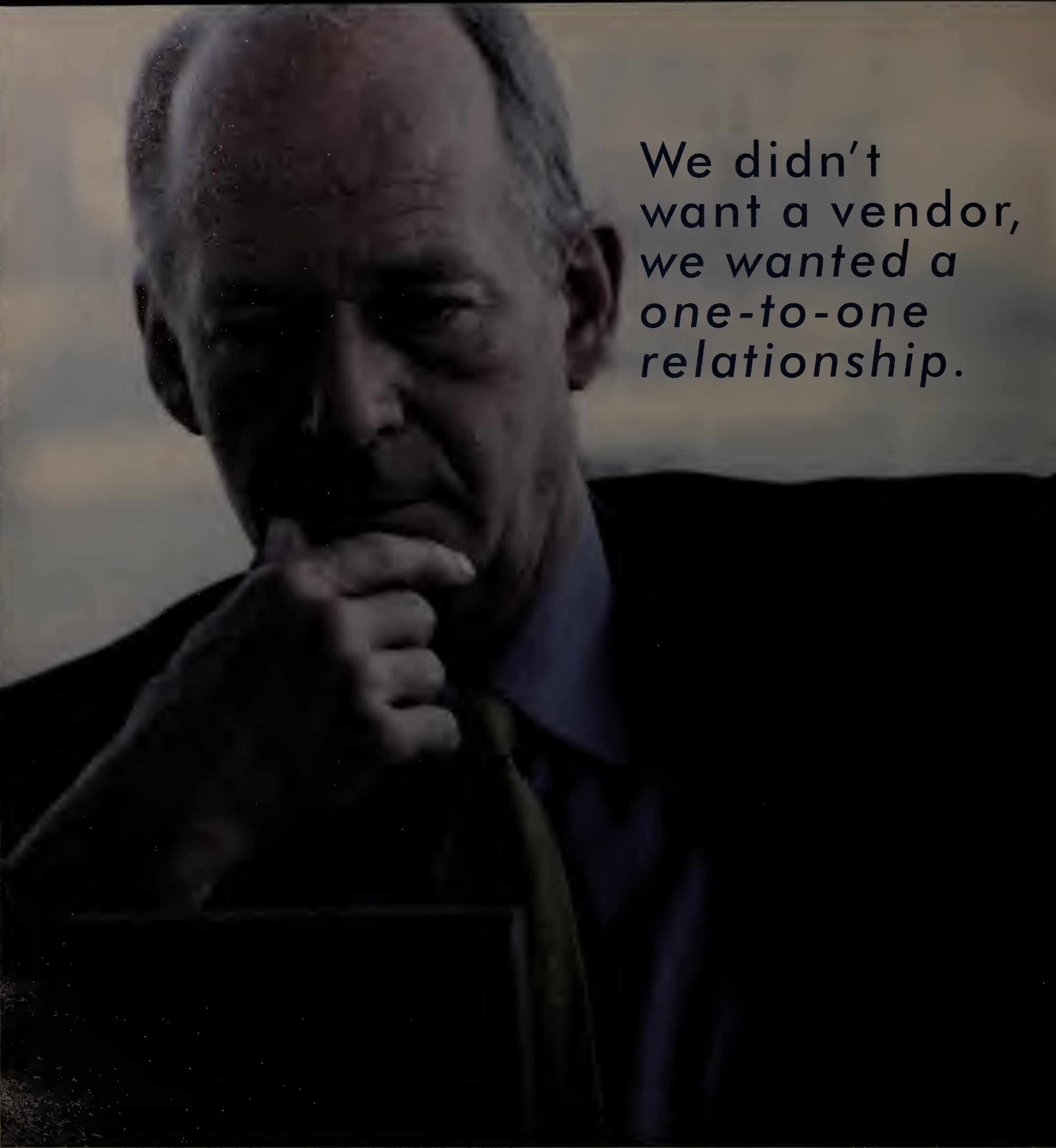
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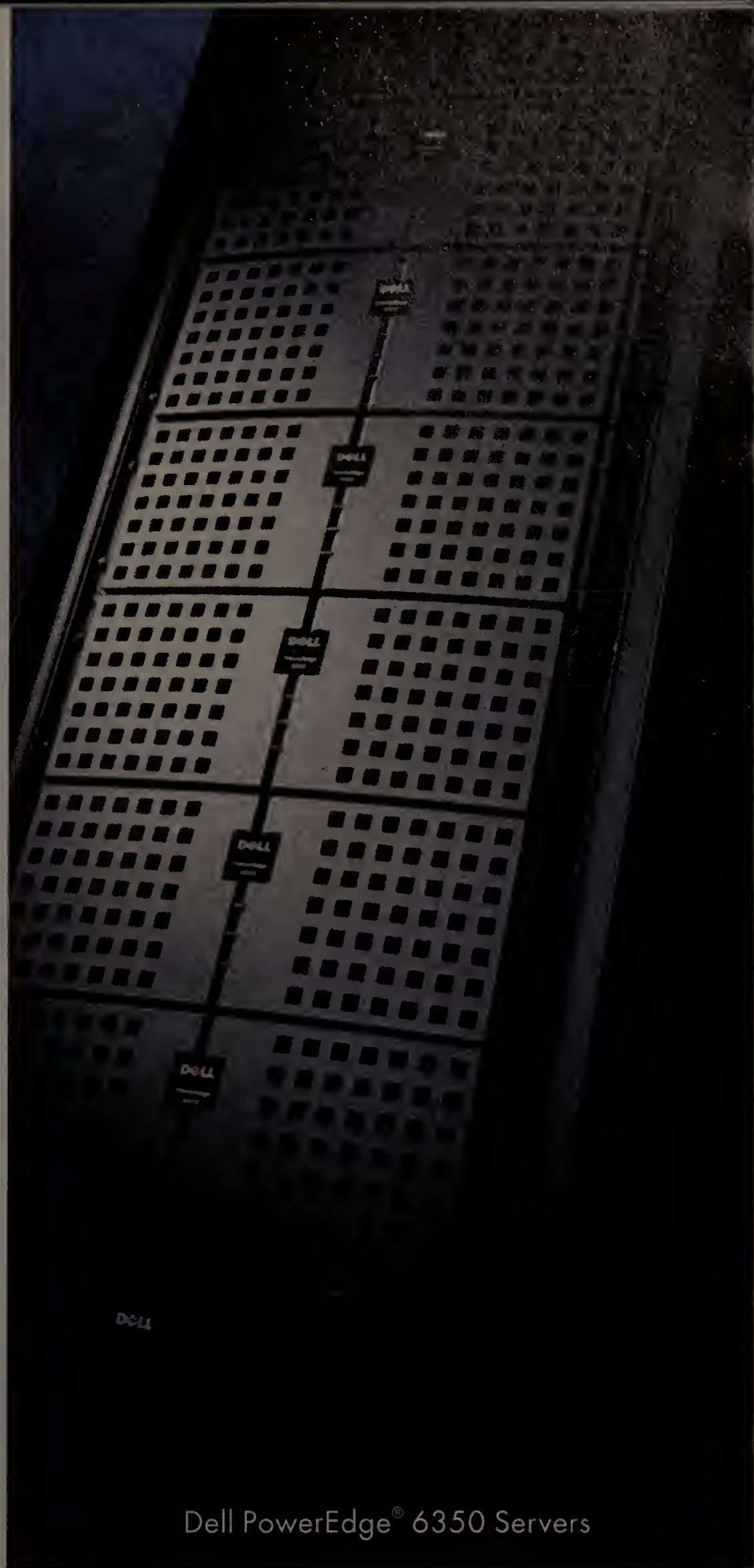
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THE Faces OF Y2K

Legal Advice

NEW YORK

At a conference in July, Jeff Jinnett, a New York attorney specializing in Y2K law, discusses conducting year 2000 risk assessments and preparing "due diligence records." The conference, "Year 2000 Event Planning," was sponsored by IBC USA Conferences Inc. in Southboro, Mass.



ANDRE SOUROUJON



KLIX

Planning for Disaster

SONY CORP. Karl Percy, left, and Ron Law look over data during a July 15 disaster-recovery planning session at Sony Music Entertainment Canada in the Toronto suburb of Mississauga, Ontario. They're part of Sony's disaster-recovery team, whose 20-plus members come from different company divisions. If there are any Y2K-related problems around the turn of the year, they'll be on the front lines, ready to respond



JESSICA BROWN

Testing a Power Plant

BALTIMORE GAS AND ELECTRIC CO. Kenneth McGreevy, electrical and instruments and controls supervisor at Baltimore Gas and Electric, monitors the downloading of a Y2K test in a control room at the utility's Brandon Shores power plant in Pasadena, Md., last year. BG&E, which has 1.1 million customers, declared its Y2K readiness June 30

Air Check

DELTA AIR LINES INC. Airline operations VP Walter Taylor, right, gazes out over Delta's Technical Operations Center in Atlanta, where aircraft parts, shop equipment and computers have been Y2K-tested. Below, developers Carol Cady and Mike Sodos test Delta's Passenger Revenue Accounting system



LYNNE SILER



LYNNE SILER

Spreading the Word

BANK OF AMERICA CORP. David L. Dorton, vice president and manager of a Bank of America branch office in San Francisco, shows teller Fiona Yau a copy of a new pamphlet on the bank's Y2K program that is being given to customers



SETH AFFOUMADO



SETH AFFOUMADO

Inside a Y2K War Room

MEDICAL MUTUAL OF OHIO Huddling together, members of the disaster-recovery team at Medical Mutual review data on the compliance of different systems within the health insurance company. The team, led by Mary Livens (in green) will use the information to determine what it may need to include in the company's contingency plans

Continued on page 63

Where Mobile IT Meets The New Millennium

go mobile

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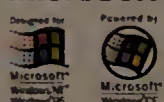


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THE Faces OF Y2K

Concerned Citizens

AUSTIN, TEXAS Television cameramen focus on a woman getting ready to pose questions to a panel of year 2000 experts at a community meeting about Y2K in July in Austin. The meeting, sponsored by the state and the city, drew about 375 people



MATT LANKES



MICHAEL ABRAMSON

A Factory Retools

JOHN DEERE & CO. Don Wood, left, and Ron Storlie replace an old, non-Y2K-compliant VAX/VMS computer, left, with a new, compliant PC on the factory floor at John Deere Harvester Works in East Moline, Ill. The computer is a key part of the process for making combine machines, which help farmers harvest grains

Virtual Corporation

BY JOYCE CHUTCHIAN-FERRANTI

IMAGINE if going to work were a matter of simply rolling out of bed and walking over to your computer while still in your pajamas. Or if a meeting with the New York-based sales department, San Francisco-based marketing department, Dallas-based distribution department, Cleveland-based manufacturing arm and St. Louis-based IT department occurred without anyone having to leave an office. Welcome to the virtual corporation.

What Makes a Virtual Company

Virtual corporations can be defined in many ways, but here are three of the most common examples:

First, a virtual corporation can be a group of skilled people who form a company but are separated by boundaries. Each person or partner has a specific function, and they all have strong communication skills, a high level of trust and a common workstyle. The partners mostly communicate via e-mail, phone, fax or videoconferencing. Often the employees work from their homes rather than an actual office building, as at Associated Competitive Strategies (ACS) (right).

The second is a group of partnering companies or people that specialize in particular functions, such as supply, manufacturing, information systems or distribution. They come together to form a temporary or sometimes permanent company that serves to tackle a particular task. The partner members communicate with one another via e-mail, phone and fax or in person. There is a high level of communication and trust, as in the above example, because the partnering companies rely heavily on one another to make a particular project work.

An example of this is AgileWeb Inc. (www.agileweb.com) in Huntingdon Valley, Pa. AgileWeb is an organization that provides manufacturing

services by leveraging the capabilities and expertise from a pool of manufacturing firms to meet the specific manufacturing needs of each client.

Third, the virtual corporation can be a large company that chooses to outsource many of its important operations, such as manufacturing or distribution. It may do this through joint ventures with suppliers or by partnering with other companies that specialize in particular areas. This allows the company to focus on what it does best. For example, a computer company might sell its own brand-name computers, but the company might not have an actual warehouse or factory. It can partner with equipment manufacturers overseas that make the computers and then send them

directly to the customers using another partner company that handles distribution. The manufacturing and distribution are done virtually. The computer company can then concentrate on sales, marketing and customer service.

Key Way of Doing Business

"This isn't hype, it's just an essential way of doing business," says Peter G. W. Keen, founder and chairman of Keen Innovations in Great Falls, Va. "Every firm is doing it."

It's true. Some companies, large and small, old and start-up, are finding that they can cut costs and leverage the most out of their staff and budgets if they partner with other companies that specialize in particular areas that they can't do as well or as

efficiently themselves.

In either case, the key to making a virtual corporation work is communication and effective IT. "The technology architecture is the organizational structure," says Keen. "Your systems can't be down." After all, if you don't have a means of communication, a company can't function. And if your communication is all electronic, well, say no more. This is true for any virtual corporation, whether it be large or small.

There's also the psychological aspect of communication. "[Virtual corporations] are supported by technology, but the challenge is that they are 90% people and 10% technology," says Jessica Lipnack, co-author of the book *Virtual Teams*. "That's where virtual

organizations are caught."

Take Mark Chussil, president and co-founder of virtual company ACS, a business simulation and strategy company.

Chussil works out of his home office in Portland, Ore. His vice president and director of sales is also in Portland, only he's 3,000 miles away in Portland, Maine. ACS also has a software developer in Seattle, a Web site developer in Portland, Ore., and consultants in both Portlands. All work from separate offices. Chussil's partner and co-founder is in Philadelphia — that is, when he isn't in Boston. All the employees work out of their homes and meet with clients and other staffers regularly, either at client sites or hotels, via e-mail or phone.

"We have close ties with each other, but the ties are all electronic," says Chussil.

No Geographic Restraints

That's one of the great advantages of a virtual corporation. From a hiring perspective, it's often a win-win situation. You can be choosy about whom you hire, and you don't have to worry about relocation issues. You also get to branch out geographically without spending money on overhead costs.

"We can hire people outside the local pool," Chussil says. "We hire the best talent that's available."

Trust and collaboration are a must in order for a virtual organization to work. And as with most companies, the virtual corporation is completely dependent on IT to communicate with others. Regardless of whether a company is large or small, if your IT function goes down, communication comes to a halt — and so does your business. ▀

Chutchian-Ferranti is a freelance writer and editor in Concord, Mass.

MOREONLINE

For more information on virtual corporations, visit our Web site. www.computerworld.com/more

DEFINITION

A virtual corporation is an organization in which nearly all staff or partners work together across boundaries. The boundaries can be geographical or organizational. The corporation's members have specific functions or skills and often use information technology to communicate.

Business, Virtual Style

Mark Chussil is the CEO and co-founder of Advanced Competitive Strategies, a business simulation and strategy company with employees and partners throughout the U.S. ▸



Q Why did you create a virtual corporation?

A We did it because it was a lifestyle preference. There are many advantages to it. Everyone who works here enjoys the lifestyle. It doesn't work for everyone, but it works for those who work here.

Q Where are you based?

A There is no home base or headquarters. When we have meetings, it's in one person's house or another person's house. There's no central location with overhead. We often meet with clients at a hotel.

Q What are the benefits to a virtual organization?

A From a business model perspective, the cost structure is advantageous. The virtual corporation keeps costs

low. We can hire anyone. We get access to the best talent that's available.

Q What are the drawbacks to working for such an organization?

A Well, for one thing, there's no watercooler effect. There's no random interaction when you bump into each other. We try to set up meetings with each other by phone conferences and client meetings.

Q Can you offer some advice to those who are considering working at or creating a virtual organization?

A Think about whether you have the discipline to work virtually, or if you need to go to an office. Definitely think through the communication side. You need access to other people, and you need a culture that supports that. Our company works because we are all very similar types of people.

Q What does it take to make a virtual company work?

A An attitude that says "Why not?" There are so many traditional attitudes that we learn in schools, from magazines and from TV. It takes someone to say "Why not do it this way?"

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JOE AUER/DRIVING THE DEAL

Short-term software licensing: Don't buy it

RECENTLY, A CUSTOMER SCRUTINIZED a vendor's standard software license agreement. The language went like this: "Supplier hereby grants to customer a nonexclusive, nontransferable license for software and related documentation for a period of three years from the date of execution of this agreement."

The problem? The customer wasn't getting what he thought he was paying for: the perpetual right to use the software. He was getting only a limited right to use the software for three years — less, actually, because the clock starts running upon execution of the agreement, not when the customer accepts the software. What's more, after the term is up, the software must be relicensed to continue its use.

Please be reminded that the software license grant section of a license agreement is one of the most important sections because it normally specifies all your rights to use the software. It's crucial to determine all the rights you'll ever need and negotiate them into the agreement. Also, contract terms and conditions need to be negotiated early in the evaluation process and before final supplier selection.

So insist on broad license rights. Without the proper license, you may be subjected to sizable relicensing or

use continuation fees downstream. To avoid that unpleasant surprise, negotiate a license with language such as: "In consideration of the license fee paid by User, Supplier hereby grants to User a perpetual, irrevocable, transferable, nonexclusive license."

Less Risk

This significantly reduces your risk and saves you money by assuring an ongoing right to use the software. With a perpetual license, you're buying the right to use the software to

run part of your business for as long as necessary. You'll have to pay annual maintenance and support fees, but these should be your option.

Your license should also be irrevocable. Otherwise, suppliers may revoke your right to use the software, and that gives them immense leverage.

If the license is irrevocable, the supplier must convince a judge that you've done something wrong and get an injunction to halt your usage.

Remember, *perpetual* and *irrevocable* are key words in

software licensing. Most suppliers these days offer neither, even though it used to be common practice. However, with a strong negotiating position on your part, a perpetual, irrevocable license can once again be obtained. Go get 'em, and you'll gain peace of mind and a better bottom line.

Mailbag

Responses continue to come in about my July 5 column on the automaker that was getting burned by a ZIP code automation software supplier. (Watch for a report on the resolution soon.)

Many wrote sharing similar advice, but most interesting was how many similar situations there were.

For most, no-cost upgrades had been done for years with only minimal administrative fees, and then suddenly a customer upgrade request was followed by a vendor invoice for an outrageous sum.

This kind of profiteering is common, but not universal. In fact, one IT manager who wrote mentioned his

ZIP code automation vendor by name and said he hadn't had any problems with the company. And guess what? It was the automaker's vendor. More proof that vendor policies aren't enforced across the board or that they are just regional profiteering ploys.

Several times I was asked, What's the name of the software company? In the automaker scenario, there was potential litigation against the vendor, so names were left out. In other columns, confidentiality is important.

But the point is, it doesn't matter what company's involved. This column is about how to do better deals, not

whom to do them with. We're equipping you to deal with anyone.

Avoiding a specific vendor mentioned in a column won't protect any IT manager from the perils of the unscrupulous, nor will relying on a vendor's good reputation. The only protection is solid contracts, negotiated up front with fair terms for both parties. ▀



JOE AUER is president of International Computer Negotiations Inc. (ICN, www.dobetterdeals.com), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High-Tech Acquisition Professionals. Contact him at joea@dobetterdeals.com.

WORKSTYLES

What's It Like to Work at Schwab Online?

Interviewee: Vincent Phillips, vice president of Web systems, electronic brokerage technology Company: Charles Schwab & Co. Main location: On the border of Chinatown and the financial district in San Francisco. "We have dim sum in walking distance." Number of information technology employees: Almost 300 in the electronic brokerage group; 1,600 in the entire IT organization. Number of registered users at Web site: More than 2 million Dress code: "It depends on who you ask. The chairman certainly thinks

there is one, but if you look closely at what employees are wearing, you'd think there's not. I have one guy who has a different pair of eyeglasses and shoes to go with each outfit. And then I have people with wildly colored hair and pierced body parts." Workday: "The typical programmer saunters in between 9 and 10 a.m. or later, and God knows when they go home. The quality-assurance folks either come in really early or really late so they can do testing without interference from developers. The day-to-day production sup-

port folks come in just before the market opens, around 6 a.m., and go home just past the close." What do you see on people's desks? "A lot of toys. Weapons of war, like disc shooters and Nerf guns. One guy has an old Mac IIc that he took the CRT out of and replaced it with a fishbowl." Percentage of staff that telecommutes: 3% to 5%, including a few who telecommute from long distances — one from Provo, Utah, and one from the Sierra foothills. On-site amenities? A concierge who takes care of dry cleaning, laundry and just about anything else involving pickups and deliveries. There isn't a gym, but the company subsidizes membership in a variety of nearby gyms, like the Chinatown YMCA and others. The one thing everyone complains about: Not enough space.

Little perks: "We get T-shirts for special projects every week or so, like a Hawaiian-style T-shirt with tropical fish and our logo in neon pink. And every couple of weeks we have a beer bash on one of our floors, where we pass out all kinds of strange trinkets." Last companywide/department perk: "Thursday [Sept. 9] on the Embarcadero we're having a Summerfest party for all the IT folks. We'll have food and bands, and employees can bring a guest. One of the bands is a bunch of folks from the IT organization. . . . Our executive vice president of operational systems is the lead singer and guitar player." Would employees feel comfortable e-mailing the CEO? They'd feel extremely comfortable e-mailing Co-CEO Dave Potrick, or Charles Schwab, whom they address as

"Chuck." "That's what he wants to be called." Quote: "One of the most fun things about this place is that everyone knows we are here to do something great for customers. People don't come to work to make a lot of money, but to work on cool stuff that real people use and that is useful to them. That's why I work here, and that's why people come here and stay. If it's not good for customers, we don't do it. And if something is good for customers, we figure out a way to do it." "[But] since unemployment in this area is like negative 30% or something, we have as hard a time recruiting as everyone else. So we review salaries several times a year to make sure that long-term employees are keeping pace with the job market for their skills."

— Leslie Goff

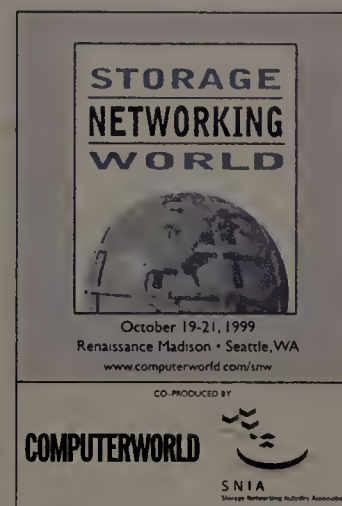
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TECHNOLOGY

TANDY PUTS NDS TO WORK

Because of NDS's security platform support and scalability, electronics retailer Tandy chose it over Microsoft's Active Directory to manage up to 200,000 objects on its intranet. **70**

IN-BETWEEN MACHINE

That's reviewer Russell Kay's take on Compaq's Aero 8000. It's nice and light but not much cheaper than true notebooks with far more power and capabilities. **74**

WEB UPDATES BY E-MAIL

Sometimes, modifying Web pages can be as simple as e-mailing a Microsoft Word document. We show how that technique worked for a temporary, highly mobile workforce — namely, the military. **70**

EMERGING COMPANIES

Brocade Communications Systems' SilkWorm switches are hot because they provide dynamic administration of large data repositories over Fibre Channel links. **80**

OPEN SOURCE AND YOU

The good news about open-source software: It's free, and you can get your hands on the source code and easily add features. The bad news: The loose confederation of

open-source developers may be slow to deliver software; support can be hard to find; and the apps may lack the slick look and feel of commercial packages. **96**

NEW ERA FOR WHITEBOARDS

Not your father's whiteboard: Exec Tech reviews two electronic models, including a "capture bar" that attaches to any flat surface and captures your hand movements as you write. **93**

WARILY WIRELESS

Country Companies Insurance is saving time and money using wireless data connections to send assignments to its appraisers. But it took some tweaks, such as storing much of the important data on the appraisers' notebooks to make the relatively slow connections pay off. **78**

THIN SERVERS

IBM takes aim at the ISP market with two thin servers, one running Linux and NT and the other Linux and AIX for RISC platforms. **76**

FLASHBACK

Bell Labs researcher Bjarne Stroustrup called his creation "C with classes." In 1985, Bell Labs first made C++ available to university users. Also that year, Steve Jobs left Apple. **98**

MORE

Hardware..... **74, 76**
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CIO MAYNARD WEBB says eBay will spend cost-effectively and prudently to upgrade its site

UPTIME IS JOB 1 FOR EBAY CIO

AS CIO AT EBAY, Maynard Webb's job is to improve uptime at the online auctioneer after a series of costly and embarrassing service outages. In the short run, that means redundant servers; in the longer run, it will mean a distributed architecture aimed at eliminating single points of failure.

78

Tandy's Got Questions; Novell Has Answers

Scalability, cross-platform support help retailer roll out applications

BY DAVID ORENSTEIN

TANDY CORP.'S ads for Radio Shack promise that if customers have questions, the electronics retailer has answers. But without a directory-managed network, Tandy won't

have an easy way to get those answers to employees at its 7,000 stores.

As it begins to roll out Web applications that will provide access to inventory and parts data, warranty information and answers to likely customer questions, Fort Worth, Texas-

based Tandy is grappling with the complexity that scale brings. Using Novell Directory Services (NDS) for Windows NT and eventually the multi-platform NDS 8, network services director Ron Cook said he's confident "we have a great solution for the next three-plus years."

"In this business, that's about as good as you can get," he added.

The drive by companies such

as Tandy to pour Web and e-commerce applications into highly distributed environments is swelling demand for directory software, which has grown from fewer than 2 million servers in 1997 to nearly 13.6 million in 2003, according to International Data Corp. in Framingham, Mass.

200,000 Network Objects

Right now, Tandy has about 11,000 network objects such as users, printers and servers. But as the application rollouts continue, Cook said, "I don't think it's inconceivable to get to 100,000 to 200,000 objects in a year to 18 months." The rollouts have just begun and will wrap up next year.

Analyst Tim Sloane at Aberdeen Group Inc. in Boston said NDS should be capable of handling Tandy's load. "I do believe Novell has put more thought into this than any other vendor," he said. Cook said NDS 8 is undergoing stress tests in Tandy's lab.

But it isn't just about scale. It's also about interoperability. The applications Tandy must manage are based on Windows NT, HP-UX and OS/390. Users also have passwords for Net-

Ware, Microsoft Exchange and PeopleSoft. Cook ultimately wants to give end users a single sign-on because confusion about logging on can quickly scuttle an employee's ability to provide answers.

"When I think of the number of calls to the help desk, one of the biggest issues is the passwords not being simpler between NT, Exchange and NetWare," Cook said. Cutting the number of user IDs and passwords in half can cut administrative costs in half, too, he said.

Ultimately, Cook said, Tandy would like to link its PeopleSoft personnel applications to systems such as Exchange so that when an employee is hired or leaves, the user accounts could be created or deleted automatically. But NDS does not run yet on HP-UX where PeopleSoft is deployed or on OS/390, another key platform for Tandy. Novell is planning ports to those platforms as well as to Linux and Tru64 Unix.

NDS's emerging cross-platform support will make it crucial even after Windows 2000 is released with its highly touted but platform-specific Active Directory, Cook said. "I like my heterogeneous network. I look forward to Windows 2000 but will be doing most of the management and security with NDS," he said.

That way, he said, "I can use the best-of-breed solutions in the right place." ▀



RON COOK: Novell Directory Services software gives Tandy "a great solution for the next three-plus years"

E-Mail Web Updates Keep Army on Track

Software lets troops use Word to update Web pages

BY DOMINIQUE DECKMYN

Setting up a Web publishing system for a short-lived, distributed and mobile team can be a challenge. When the U.S. Army Signal Command was looking for an easy way to communicate troop status during a military communications exercise, Real-time Page Management (RPM) from little-known Reedy Creek Technologies Inc. in Four Oaks, N.C., fit the bill.

RPM lets users enter or modify Web pages in Microsoft Word. A Word plug-in then sends the information to the Web server via an encrypted e-mail message. Ken Thompson, a major in the U.S. Army Reserve and a data network officer for the Grecian Firebolt exercise, said he liked how the system allowed users on the move to update a Web page without having direct access to the Web server, easing security concerns.

Fast and Flexible

The software let Thompson assign users the right to modify only certain parts of an HTML document. But, importantly,

Thompson said, he also needed a system that was "very, very flexible and that could be put together quickly by one person." That ruled out more complex database-driven systems. The Army considered Microsoft Corp.'s Visual InterDev for the task, but there was no time to do custom development, said Thompson.

Grecian Firebolt involved 5,000 people in multiple countries. The exercise aims to set up an ad hoc international communications network based on Internet standards but separate from the public Internet. The Army has set up

such so-called "tactical Internets" during Desert Storm and in Bosnia, Thompson said.

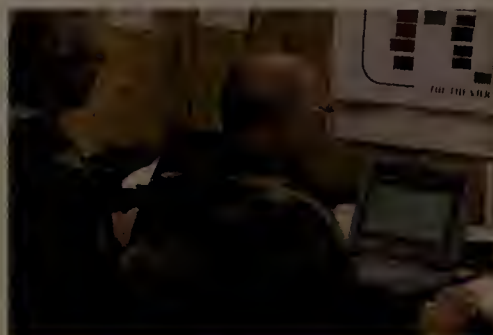
Neal Davis, president and CEO of Reedy Creek, said the product offers much of the security and fine-grained control offered by dynamic, database-driven Web content management products such as those from Vignette Corp., but with less complexity and cost.

RPM costs \$599 in a version that allows for 25 "ports," or modifiable zones on a Web site. It runs on Windows NT, Linux and several Unix variants. RPM has been available since last year, but it's only now being marketed on a national level.

The Research Triangle Regional Partnership, a nonprofit organization, is also using

RPM to allow multiple nontechnical staff members to update its Web site.

But analysts are skeptical about the concept's broader appeal. "I can't see any real advantage to [updating Web sites] by e-mail rather than through a browser," said Harley Manning, an analyst at Forrester Research Inc. in Cambridge, Mass. ▀



RPM SOFTWARE lets users modify Web pages from remote locations

A WORD ABOUT THE NEW MANAGEMENT TEAM: **ATTITUDE**



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Antispam Organization Critical of EU Opt-Out Proposal

BY DORTE TOFT

The European Commission won't succeed in protecting consumers against unwanted e-mail with rules proposed in Brussels last week, according to Ray Everett-Church, a co-founder and counsel for the Coalition Against Unsolicited Commercial E-mail (CAUCE), a volunteer organization based in the U.S.

The proposed opt-out registers are likely to have little, if any, effect on the flood of e-mail promoting pornography, get-rich-quick scams and products, said Everett-Church, who is the chief privacy officer at Internet company AllAdvantage.com in Hayward, Calif.

According to the proposal, all 15 member countries of the European Union will make available to consumers a register in which they can state their preference to not receive unsolicited e-mail, and companies will be obliged to respect their wishes.

If the rules, part of a revised framework for e-commerce proposed by CAUCE, are passed by the EU's Council of Ministers later this year, all EU countries will enact them.

History's Lessons

The U.S. experience with opt-out registers — whether targeted at limiting direct mail, telemarketing or spam — isn't encouraging, according to Everett-Church.

"Take e-mail. It makes very little economic sense for the companies to use time in order to take people out of their list when the cost of sending an e-mail is almost nothing," said Everett-Church.

Also, a lot of spam is attributed to companies operating on the "fringes of legality," doing all they can to avoid being traced and made accountable, Everett-Church said. "They will never use such a register," he said.

The only effective way to protect people is to ban spam, just like the U.S. bans unsolicited advertisements via fax, said Everett-Church.

"Ignoring the [fax] ban costs a fine of between \$500 and \$1,500 per fax received, and that helped stop the practice," he said.

However, the European Parliament rejected a proposal to

ban spam in May in a 266-137 vote. (To see how individual members of the European Parliament voted, visit the site

www.euro.cauce.org/en/vote_result.html.)

In the U.S., about eight states have already passed laws limit-

ing spam in various ways, and laws are pending in more than a dozen states, according to Everett-Church. He said he ex-

pects a federal law banning spam to be passed. "Several proposals are pending on Capitol Hill," he said. ▀

Toft writes for the IDG News Service.

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Compaq's Lightweight Aero 8000: The In-Between Portable Machine

At 3 lbs. it makes a neat thin client, but wimpy CE apps limit its usefulness

BY RUSSELL KAY

PSSST! I TURNED to see a sleazy-looking character in a dirty trench coat. "Hey," he said. "Wanna real good deal on a laptop?" He swung open his coat to reveal a notebook on a shoulder strap. "It's a steal," he continued. "A brand-new Compaq, 32 megs of RAM, built-in modem, costs under a grand. Comes loaded with all the Microsoft Office apps, e-mail, Web surfing, the works. And it weighs under 3 pounds."

This was too good to be true. I asked how big its hard disk was. "Er," he muttered, "it's new technology, doesn't need a hard drive."

I asked if it ran Windows 98 or NT. "Oh, it's real Microsoft Windows, see."

That's what I thought he said. However, he was cleverly trying to conceal the truth: Windows CE, Microsoft Corp.'s cut-down operating system for handhelds.

REVIEW

I took a closer look. Compaq Computer Corp.'s new Aero 8000 is about 20% smaller than a typical laptop and a lot lighter. Unlike most CE machines, the Aero doesn't use a touch screen or stylus, preferring a touchpad and buttons. Of all the Windows CE machines, this could be the best.

I've enjoyed using the Aero 8000 — I drafted this review

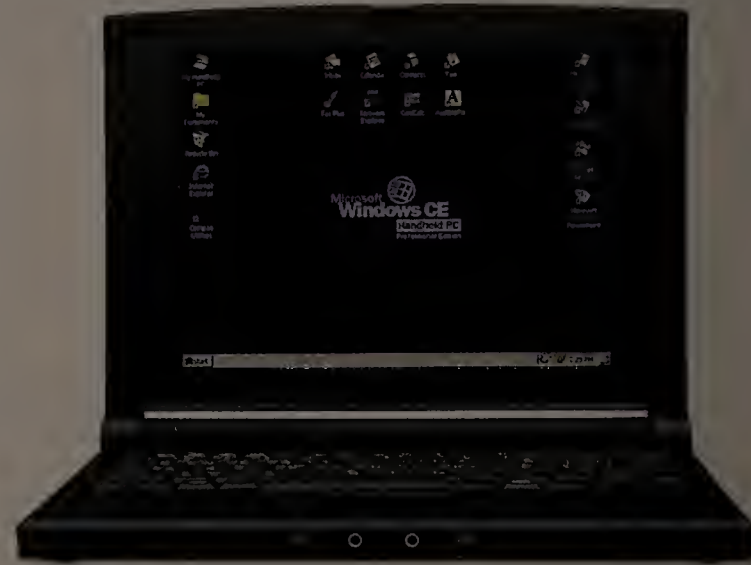
on it — but it's really a puzzle, raising important questions about the direction of portable computers.

With its sleek 3-lb. body, 10-in. screen and small-but-OK keyboard, the Aero looks a lot like Sony Corp.'s Vaio 505 or IBM's ThinkPad 240.

But those machines use Windows 98 (the ThinkPad even runs Windows 2000), while the Aero makes do with Windows CE and its cut-down applications — Pocket Word, Pocket Excel, Pocket Outlook and others. You can view a PowerPoint presentation, but you can't edit it or create a new one.

CE's limitations aren't a problem unless you're expecting it to do a lot more than it can. But the \$949 Aero isn't much cheaper than a "real" laptop. There's no floppy, no hard drive and no CD-ROM.

For storage, you have to add



compact flash or PC Card memory cards or hard disks. I've seen Windows 98 laptops (admittedly not lightweight) selling for well under \$1,500, and for that you get double the RAM, a hard drive and CD-ROM and a larger screen. In today's market, you can buy two desktop PCs for the cost of

one Aero. Looking at value, CE loses. So whom is the Aero aimed at?

The Aero is instant-on; lift the cover and you're up, with no wait for booting. Battery life is significantly longer than a notebook, sometimes getting past eight hours.

Also, the Aero can be a useful thin client. You can dial in to an NT terminal server and run regular Windows applications.

Finally, the Aero offers enhanced security via a built-in SmartCard reader for use with access control and encryption software. Thus, the Aero could look good to IT managers seeking a secure, mobile thin client.

One more try. Is this the answer for the person who wants to travel light but still do word processing, e-mail and spreadsheets on the road? If it's not for the road warrior, maybe it's OK for the road wimp.

I tested that by taking the Aero on a trip.

Right off the bat, I couldn't connect the Aero to Computerworld's Notes e-mail. I needed configuration information that I didn't have. I did use Pocket Outlook to send and receive POP3 Internet mail (IMAP4 works, too). I sent and received images and Microsoft Word and Excel documents as attachments.

In sum, the Aero 8000 is a decent traveling companion, easy on the shoulder, but I found it barely adequate in features and power. ▀

RUSSELL KAY/COMMENTARY

It's dead, Jim: Lessons from a laptop crisis

ITURNED ON MY laptop and nothing happened. Oh, a couple of lights came on, but the screen stayed blank, and there was no reassuring whir from the disk drive.

I've had plenty of experience booting problem-ridden computers, but here I was buffaloes — not even an error message. I tried the usual tricks — Escape, Return, Ctrl-Alt-Del, gently shaking and tapping the box, reseating connections, turning it off and on.

Zilch. Nada. Zip.

Hard drives are mortal, even with 1 million-hour-mean-time-between-failure specs. They still die unexpectedly and, like most deaths, they upset us. Laptop drives are particularly

vulnerable as they are carried about, bumped and inevitably dropped.

As a computer security veteran, I know the importance of backup. But, like most users, I've sometimes been negligent about my own PC. Some new software, however, has made backup easy. There's Iomega Corp.'s QuikSync, which works only with that company's own Zip, Jaz and Klik drives, and AutoSave from V Communications Corp.

When my laptop died, I was using AutoSave, which

backs up a file to an alternate location when the file is closed. By default, AutoSave saves to an other directory on your hard drive, which wouldn't have helped me. But I was saving to a 260M-byte hard drive from Calluna Technology Ltd., the \$299 Callunacard, which plugs in to a type II PC Card slot (the thin one).

I plugged the Callunacard into a second laptop, installed AutoSave, and within 10 minutes I had everything

back. Almost. I had accepted AutoSave's default settings about what (and what not) to save, so I lost some files.

I estimate the incident cost me about a half-day of work, plus the equivalent of another full day later on configuring a new laptop.

There's another potential cost: This laptop was on loan for review. If I return it


to the vendor, what happens to the data on its hard disk — unpublished articles, interview notes, test results, e-mail and confidential documents?

I have to decide whether to start encrypting my entire hard disk, or at least some specific

data directories. I don't want to, but neither do I want to worry about my data's confidentiality again. ▀



RUSSELL KAY is Computerworld's reviews editor. He can be reached at russell_kay@computerworld.com.



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IBM Unveils Servers for Internet Providers

BY STACY COLLETT

IBM is taking aim at the Internet service provider market with a pair of new thin servers

to be available by month's end.

Netfinity 4000R, code-named Intimidator, will be a 1.5-in.-thick stackable unit.

Priced from \$3,000 to \$4,000 depending on configuration, the 4000R includes a 500-MHz Pentium III processor and will

run Linux and Windows NT.

IBM this month will also unveil the Netfinity RS6000 Model B50, called Pizazz. It's 3 inches thick and comparable with the 4000R in performance, but it runs Linux and

IBM's AIX for RISC platforms.

"It's all about a push toward the [Internet service provider] market," said a spokesman for IBM. "The biggest concern they have is to get their system up and running as fast as possible."

IBM will offer configure-to-order and preinstalled NT on the new servers.

Early in the first quarter, IBM will also preinstall software based on the configuration requested by an Internet provider.

That way, Internet providers or application service providers can order a server, pull it out of the box, slide it into the rack, plug in the power and network connections and be up and running. The servers' small size also lets Internet providers expand without space constraints.

About 30 software vendors will offer applications for the new IBM servers, according to a company spokesman. They include Inktomi Corp., Real Networks Inc. and Resonate Inc. ▀

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Via Finalizes Takeover

BY TERHO UIMONEN

Via Technologies Inc. last week announced it has completed the takeover of the PC microprocessor assets of National Semiconductor Corp. subsidiary Cyrix Corp.

An undisclosed part of the \$167 million sale price was paid at closing, with the remainder to be contingent on revenue from Cyrix product lines, the Taiwan-based chip vendor said in a statement.

The deal gives Via all assets pertaining to the MII line of x86-compatible processors and successor products previously owned by Santa Clara, Calif.-based National Semiconductor. It also makes Via the only Taiwan-based company to compete head-to-head with chip giant Intel Corp. in the market for PC processors.

Via last month announced plans to purchase the x86-based processor business of IDT Inc. in Santa Clara, Calif. ▀

Uimonen writes for the IDG News Service in Stockholm.



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New CIO at eBay Aims To Improve Uptime

Says distributed architecture, redundant servers should reduce costly outages

AS THE recently appointed CIO at eBay Inc., **Maynard Webb**'s first task is to stem a series of embarrassing service disruptions that have cost the world's largest online auctioneer millions of dollars in lost revenue and lowered the price of its stock. Webb, a former CIO at PC maker Gateway Inc. and an information technology executive at companies such as Bay Networks Inc. and Quantum Corp., spoke with *Computerworld* senior editor Jaikumar Vijayan about his plans for eBay.

Q: What has caused the disruptions?

A: We have an extremely scalable and tight application that is all written in C++ and has a lot of headroom and legs left to run. What we didn't do so well was to put as much focus on reliability and availability of our platform. We didn't have hardware redundancy and fail-over, so if our database server crashed for any reason, we had to fix all of the elements of the server itself to be able to roll back and get the site back up.

Q: What are you doing about it?

A: We already have a warm backup situation where we should be able to get back up ... within two to four hours of an outage. By the middle of October, we will have a high-availability backup [with fully redundant servers] that will have us back up within an hour.

At the same time, we are working on our next-generation architecture plan to [eliminate] any single point of failures. We are looking at distributing the application and database over multiple servers to make sure we can handle the 100x growth in database activity we are experiencing.

Q: What kind of testing are you doing?

A: Building a test environment to simulate all this is not a trivial thing. I would like to spend more time testing [applications], but we've got time-to-market issues. We've spent a lot of time improving our quality assurance capability. I think we

Q&A

have done a reasonable job of testing a lot of the changes [to] do a very safe rollout [and making sure] that we are implementing all our operational policies and procedures.

Q: So how do you figure out how much capacity you need?

A: It is an art, not a science. I was just at a meeting where we were talking about [immediately] adding more DASD [direct



EBAY CIO MAYNARD WEBB is on a mission to stem service disruptions that have cost the online auctioneer millions of dollars

access storage devices] than we would have in a six- to eight-month period. You simply have to get tighter, simpler and be smarter on things like archiving and DASD management.

Q: How do you figure out how much to spend on upgrading your site?

A: We know exactly what downtime can cost us in lost revenue. We have a very strong and very loyal user community, and the biggest roadblock is our inability to scale. We will spend cost-effectively and prudently. It would be silly for us not to buy the capacity we need and to stay ahead of our wildest dreams on capacity.

Q: What advice do you have for companies grappling with similar issues?

A: I think you need to bring an elephant gun to kill a mouse. Hardware is cheap, the pace of the game is frenetic, and being the first mover in an industry like this is very important. You really need to figure out what the business plan is, do a what-if scenario that is beyond your wildest dreams and build an architecture that lets you scale beyond your wildest estimation. ▀

Wireless Rollout Eases Appraisers' Work

Attention to technical details key to making strategy reliable and cost-effective

BY MATT HAMBLÉN

Country Companies Insurance Group recently rolled out wireless data connections for 85 of its auto claims appraisers, saving them an hour's time each day and speeding customer response time.

Like many companies, Country Companies, in Bloomington, Ill., knew the wireless technology would ease data access. But fussing with the technical details was key to making it reliable and cost-effective, managers said.

When a customer makes an accident claim, he calls a toll-free telephone number, and an

agent takes the data and transfers it to a Bloomington-based mainframe. About 15 minutes later, the appraisal is assigned and sent wirelessly to the correct appraiser.



GARY SHAY: Country Companies can complete 20% more estimates per day with the wireless approach

In order to keep radio air time costs down, appraisers, who use the BellSouth Corp. Wireless Data Network to receive assignments several times per day, wait until night to send back the appraisal reports over a wireline network, said Gary Shay, manager of claims support.

Shay negotiated a deal to pay up to 37 cents per kilobyte of data transmitted wirelessly. The data is sent at 9.6K

bit/sec., with an actual time to download a claim assignment of about 45 seconds.

BellSouth's network, like many wireless competitors', wouldn't reach every appraiser's territory in the western U.S., so only about half of its 145 appraisers even try wireless access. The rest use conventional land lines.

To make efficient use of the network, each appraiser's laptop comes loaded with a database of automobile types and parts, so claim assignments downloaded to the clients are kept to 5K to 15K bytes. The amount of data on the client is 420M bytes.

Going wireless has saved driving time for appraiser Ken Smith, who has often made a connection when finishing an appraisal and found that the next assignment is close by.

Shay estimates that the company can complete 20% more estimates per day with the wireless approach since it began to roll out the wireless ac-

cess in May. And customers usually get a claim check as soon as the appraiser finishes because he prints a report from his laptop.

Company officials declined to state the cost of the wireless system or its return to the bottom line.

The 140 appraisers have been familiar with the laptops for more than a year, running a popular appraisal-estimating software called PenPro from ADP Claims Solutions Group in San Ramon, Calif.

ADP worked with Nettech Systems Inc. in Princeton, N.J. Nettech sells Smart IP, software that runs over TCP/IP but cuts packet counts by up to 80% and actual data by up to 60% using a proprietary protocol, analysts said.

Andrew Seybold at Andrew Seybold Consulting Group in San Jose, said Nettech's software is one important reason wireless will begin to make sense for average companies.

TCP/IP is "actually a terrible wireless protocol and way too chatty, but Nettech takes the TCP/IP and makes it much more efficient," Seybold said. ▀

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Weaving a Storage System With Fibre

Brocade bets big on Fibre Channel as the future of storage and networking

BY CYNTHIA MORGAN

CAN A 1,000-POUND industry gorilla also be the new kid on the block? Sure, when you're talking Fibre Channel. Now that there are signs that Fibre Channel may finally come into its own, (relatively) old hands at it, like Brocade Communications Systems Inc., are taking on a new luster.

Fibre Channel is a networking technology that works best when it's exchanging huge amounts of data over a relatively short distance. It's tailor-made for delivering data from storage to microprocessor in a disk farm or storage-area network (SAN), or between servers in a cluster.

First defined by the American National Standards Institute in 1992, Fibre Channel was seen as a solution to the looming I/O bottleneck.

Fibre Channel delivered data at gigabit rates. It was also capable of carrying popular data transfer protocols such as IP, Hippi and SCSI simultaneously. And it had sign-ons by major players in the network storage game: Hewlett-Packard Co., IBM, Sun Microsystems Inc., Seagate Technology Inc. and EMC Corp.

But when Sun announced the first true Fibre Channel product in 1994, a storage array subsystem for its SPARC server line, buyers didn't exactly stampede to the checkout counter. So with all that Fibre Channel had going for it, why didn't it take off?

First, it was too new. Data centers, particularly those with a massive investment in older storage equipment and lots of data to protect, don't leap for every new technology that comes along. Second, although Fibre Channel showed promise, the management software needed to exploit its capabilities just wasn't there.

Besides, like every hot new technology, Fibre Channel suffered from an excess of proprietary products. Despite the technology's firm grounding in standards committees, there was only a slim chance that one company's Fibre Channel products would work with another's. The most popular Fibre Channel connections linked one Fibre Channel device directly to another in a point-to-point arrangement.

Unless those devices could interoperate, CIOs had the choice of replacing every relevant device with one that supported one company's Fibre Channel solutions — incredibly costly or even impossible — or winding up with two very fast, very expensive devices talking just to each other, not much use in the broad-scale enterprises where Fibre Channel was desperately needed. So most Fibre Chan-

nel products languished in the background.

Several things have happened to change that. First, network management technology has slowly evolved to embrace dynamic storage allocation, high-performance backup and other around-the-clock data capabilities. Second, Brocade recently signed agreements with Tivoli Systems Inc. and Computer Associates International Inc. And CA's UniCenter will incorporate those capabilities into a Fibre Channel SAN management system.

Rather than linking two devices only to each other, Fibre Channel switches such as Brocade's SilkWorm series can mesh several interconnected Fibre Channel devices and switches into a storage network fabric. Storage network fabrics work much like the routers that weave enterprise resources together. Any connected Fibre Channel device is cross-connected to its neighbors — add a new port and you increase capacity for all devices in the fabric. The storage

fabric topology fits very well into this model; it allows for automatic fail-over to a second device somewhere in the mesh if the first device goes down.

The SilkWorms can also cascade, or nest, multiple switches in the same fabric, making it possible to increase the number of available connections. And administrators can create special user zones within the network, complete with additional firewall protections.

The increasing popularity of SANs and knowledge management systems demands loads of mission-critical data, so network administrators are increasingly specifying a Fibre Channel solution.

Those trends seem to be working for Brocade; the company's May 1999 initial public offering, at \$19 per share, quickly earned \$65 million, beating out most of this year's dot.com IPOs. The stock is currently selling for about \$190 per share, 10 times its original asking price.

Brocade's goal, to eventually replace high-performance hubs in networks, is more than a little ambitious. If it succeeds, it will bring the cost of Fibre Channel technology to the workgroup level and below. And if that happens, Brocade will be sitting in a very pretty position indeed. ▀

the buzz

STATE OF THE MARKET

SAN Switches: The Hot Ticket

From all indications, network plumbing is a very good business these days.

In the data storage market, SAN switches are definitely hot. Brocade now owns something like 80% of the Fibre Channel SAN switch market and is an OEM for part of the remaining 20%.

Brocade faces stiff competition from other technologies. SCSI probably won't be among them because even the newest versions can't touch Fibre Channel's speed and port support.

But Gigabit Ethernet has come on fast, and its 1.25G bit/sec. data rate tops Fibre Channel. Although Gigabit Ethernet is more attuned to networking storage, a lot of great companies sell the technology. Even Asynchronous Transfer Mode, down for the count in other areas, is a possibility here.

The Fibre Channel community seems to be getting its act together, however. The industry's push for an open standard in SAN technologies has helped interoperability. This will lessen Brocade's market dominance in favor of competitors like Ancor Communications Inc. (www.ancor.com) in Minnetonka, Minn., Gadzoox Networks Inc. (www.gadzoox.com) in San Jose and Vixel Corp. (www.vixel.com) in Bothell, Wash.

Brocade Communications Systems Inc.

Location: 1901 Guadalupe Pkwy.
San Jose 95131

Telephone: (408) 487-8000

Web: www.brocade.com

Niche: Fibre Channel switches for SANs

Employees: 140

Milestones:

- 1995: Company founded
- 1999: First switch shipped

Customers: NASA, Burlington Coat Factory Warehouse Inc.

Financing: Original financing came from a series of venture capitalists such as Crosspoint Venture Partners, JAFco America Ventures Inc., Mohr, Davidow Ventures, Imperial Bancorp and LSI Logic Corp. Additional funding from an initial public offering in May raised \$65 million.

Products: Brocade SilkWorm Fibre Channel switches

Technology partners:

Data General Corp., Groupe Bull, IBM, McData Corp., NEC Corp., Network Appliance, Sequent Computer Systems Inc., Siemens Computer Systems, Silicon Graphics Inc., Storage Technology

Why it's worth watching: Brocade's SilkWorm switches are the backbone of a Fibre Channel SAN and one very good way to get to true dynamic

administration of large data repositories.

Company officers:

- Greg Reyes, CEO
- Kumar Malavalli, vice president of technology and founder
- Paul Bonderson, vice president of engineering and founder



BROCADE CEO GREG REYES (right, with Vice President Peter Tarant): "Our goal is to replace network hubs with Fibre Channel switches . . . and have that make sense"

Corp., Computer Associates International Inc., Emulex Corp., Legato Systems Inc., QLogic Corp., Tivoli Systems Inc. and Veritas Software Corp.

Red flags for IT:

- Brocade pretty much owns this market, but it derives a massive percentage of its income from just a few cus-

tomers. If one decides to head for another technology — which could happen — Brocade could have trouble recovering, and prices would definitely destabilize.

- To gain widespread acceptance, prices must drop. To do that, sales volumes must increase. SANs just aren't happening that fast.

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Gartner Group Outlook

Speed to market fuels
E-Business outsourcing.

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E-Sourcing Options

New service models address
growing need for expertise.

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Get It Off Your Chest

Your outsourcing vendors
can do better if you speak
up.

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John Bace, Research Director at Gartner Group
The Honeycomb Marketplace:

A BORDERLESS ENTERPRISE IN A FRICTIONLESS MARKETPLACE

John Bace is research director for the Gartner Group. During the past few years he has observed the volatile market impacts caused by Y2K and E-Business. We interviewed him regarding the dynamic nature of E-Business outsourcing.

CW: How would you measure the growth of outsourced e-business development over the past year?

Bace: I have some Dataquest figures on how much money has been spent and what's projected toward professional services in the e-business or e-commerce arena. In 1998, \$8.5 billion was spent worldwide on IT professional services for e-commerce. One-half of that was spent in North America. With a 23.3% compounded annual growth rate, it should grow to about \$24.4 billion by 2003.

CW: What's your gut sense about the growth that we're seeing, and how is that growth manifesting itself?

Bace: The e-commerce marketplace is one of the most frenetic in the history of IT. It's worse than Y2K ever was, and I spent almost two years doing research on service providers in the Y2K marketplace. It is so much more frenetic because people have the perception that they are already behind in the marketplace. You literally have people going out these days and trying to buy five pounds of e-commerce to get on board or to have something in place.

CW: How do you distinguish between e-commerce and e-business?

Bace: E-business is the sizzle on the steak right now. It really is much deeper and broader than e-commerce.

CW: E-business seems to be a more complete cradle-to-grave proposition, as opposed to e-commerce, which some people seem to think is already passe.

Bace: Many people are treating e-commerce as nothing more than the Webification of the hub and spoke system. E-business is integral in the enterprise move

toward what I refer to as a honeycomb marketplace: a borderless enterprise in a frictionless marketplace.

CW: What are the current trends

impacting the outsourcing of e-business and e-commerce?

Bace: If we're talking about pure outsourcing, probably speed to market. The need to

do it as quickly as possible.

CW: What are the primary reasons people are turning to outsourcing for e-business?

Bace: Many enterprises are

unable to grow these types of skills quickly enough, so you have to turn to outside people for help. Additionally, the other reason why people are
 (Continued on page 10)

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Gopi Bala, Director, The Yankee Group

E-SOURCERS MOVE CLOSER TO THE CUSTOMER

Gopi Bala is director, management strategies research practices, The Yankee Group. As a keen observer of the e-business scene, he has had first-hand experience dealing with both large and small companies moving into e-business and e-sourcing. He discussed his views on e-sourcing during a recent interview.

CW: How do you define e-sourcing?

Bala: The sourcing of Internet-related IT services is what we call e-sourcing. You've got traditional IT services, which range from consulting, to systems integration, to outsourcing, to traditional technical support. When you bring it into the Internet regime, you have new developments—Internet data centers, for example. In applications outsourcing, traditionally you had application development and maintenance, and managed application services. Now there is the ASP market, wherein the applications service provider leases or rents applications 'by the drink.' Couple it with Internet Integration Services and Internet based support and you have e-sourcing.

CW: Please describe the applications service provider model.

Bala: It helps to look at it historically. Two types of outsourcing have worked traditionally with larger firms. In pure applications outsourcing, usually the customer's staff is acquired by the outsourcer. In a more 'managed' applications environment third-party service provider staff is brought in to augment existing in house staff/skills in maintaining those applications or adding new application functionality. Now, traditionally, organizations also viewed all applications as strategic and preferred to keep them in-house and not be taken 'off-premises.' There is usually a large financial investment in those applications. What the ASP model allows is for many applications to be actually owned by the vendor and provided on as needed basis for the customer.

CW: Please discuss that.

Bala: Leveraging the Internet as a delivery mechanism, this is a viable option for many companies that couldn't make the large up-front investments needed. There are benefits for both large and mid-size companies. This 'utility' model works when the

degree of customization needed to serve any one customer can be contained. With the application utility model, the user

gets applications on tap and gives many customers a better total cost of ownership profile. They don't have to invest in the applications, they don't have to be blindsided by changes in technology—those risks are passed to the vendor.

CW: Do they pay a retainer as well, or is it only for services rendered?

Bala: There is a mix of contracts. There may be some retainer fee if the level of customization is high. It's a very new model, and the pricing

strategies are just being tested in the marketplace.

CW: How rapidly are e-business firms developing the expertise they need to run their own businesses without e-sourcing?

(Continued on page 11)

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About BrainStorm Group

Based in Northboro, Massachusetts, BrainStorm Group, Inc. was founded in 1997 by Gregg V. Rock with the intent of establishing itself as the premier producer and developer of high technology conferences and events. In addition to the SMARTsourcing Conference, the YEAR 2000 National Symposium Series and the XML Leadership Series, BrainStorm Group offers a set of integrated services in the areas of proprietary conference development and the outsourcing of content development, sales, event marketing and management for the high technology marketplace.

Visit our web site
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BrainStorm Group's SMARTsourcing™ Conference Series is the industry's premier meeting place for senior business and IT management to evaluate their strategic sourcing options with the world's leading IT Outsourcing and E-Business services and solution providers.

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The official publication of BrainStorm Group's SMARTsourcing Conference Series. The second of this two-part series features insightful articles including:

- ▶ Gartner Group's John Bace, Research Director, addresses the dynamic nature of E-Business Outsourcing in "The Honeycomb Marketplace: A Borderless Enterprise in a Frictionless Marketplace." Page S-3
- ▶ Gopi Bala, Director, Management Strategies Research Practice, The Yankee Group, discusses the e-sourcing landscape in "E-Sourcers Move Closer to the Customer." Page S-5
- ▶ William M. Ulrich, president of Tactical Strategy Group and SMARTsourcing Co-Chairman, identifies additional tips for leveraging your relationships with current strategic partners in "Challenge Your Outsourcing Vendors." Page S-9
- ▶ An overview of our upcoming conference programs can be found on the facing page. Visit our web site at www.brainstorm-group.com for complete conference agendas, list of presenters and audio overviews.

Special Thanks

The SMARTsourcing Conference Series has become a reality thanks to the support of our Event, Media and Analyst Co-Sponsors, which you will find recognized throughout this Solutions Guide and our web site. Additional thanks goes to our presenters and Executive Advisory Board Members (see page S-7) whose expertise and insight has been integral in establishing the SMARTsourcing Conference Series as a must-attend forum for IT Sourcing professionals and practitioners.

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BrainStorm Group has brought together the world's leading IT Outsourcing and E-Business experts to provide you with winning strategies for incorporating SMARTsourcing™ into your organization. No sales pitches, no fluff—just the information you need to make an informed decision. The SMARTsourcing Conference Series is committed to providing you with unbiased information on the latest sourcing options, trends, and developments.

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Case Studies

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Chris Campbell
Director of Sourcing
Strategies
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Bill Martorelli
Vice President of Application
Resourcing Strategies
Hurwitz Group

Wendell O. Jones
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Oakle Williams
Author of
Outsourcing: A CIO's
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Stephanie T. Moore
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E-Business Services *BRIEF*

Leveraging Your Legacy Systems for E-Business

With careful planning, old systems can be taught new tricks

Stephanie Moore is Director, Giga Information Group, in Cambridge, MA and one of the leading experts on Y2K remediation. We interviewed her on the issues surrounding the use of legacy systems in e-business environments.

CW: What are the primary issues related to leveraging legacy systems in the e-business world?

MOORE: Companies have spent the last several years and significant amounts of money renovating mission-critical legacy systems for Year 2000 compliance. As they finish up these projects, they realize a couple of things. One is that there is now a huge application backlog that must be dealt with, and the other is optimizing the Internet as a competitive weapon. So, to rapidly deal with the application backlog and to take advantage of the cost benefits associated with the Web, many organizations are attempting to leverage, rather than rewrite their legacy systems by extending their reach and their use. Rewriting legacy applications from scratch takes too long, costs too much, and in some cases, requires a whole new set of skills.

CW: Are some of these pre-ERP systems?

MOORE: Sure. A lot of companies are saying, "I have this old mainframe that contains years worth of critical data. Given my time constraints, how can I get this system out to the Web so that my customers can have access to it? Or how can I use it to take orders on-line, so that the customers can serve themselves? I don't want to rewrite this huge system but maybe I can extend it or reuse parts of it."

CW: What's the answer? What can they reuse?

MOORE: There is a plethora of options, starting with some more tactical, browser-based, screen-scraping techniques that will enable companies to give external customers access to these legacy systems. Previously, these systems were only accessible to internal users, and generally, a select group of internal users. Now there are technologies that allow companies to take those systems and safely deliver them not only to all internal users, but to external customers as well. At a more strategic level, companies can extract and reuse important logic from their legacy systems. These extracted components can be wrapped and reused in new applications development so that this legacy functionality doesn't have to be recreated.

CW: What are some of the pitfalls that users encounter in this kind situation?

MOORE: One of the big problems with these types of scenarios is that companies will sometimes find a tool or a technology solution and look for a business problem to solve using the technology. Companies should instead be taking a business driver—cost initiatives, customer relationship management, systems consolidation—and mapping that to a technology solution.

CW: Provide an example of a business driver for legacy renewal.

MOORE: An important and common example of a legacy renewal business driver is simplifying and expediting system consolidation. Many companies find themselves with a variety of business systems gained through acquisition or merger. It is not unusual for these systems to be performing similar functions for different companies in the corporation. So, they are attempting to determine which systems perform which key business functions, which of these functions are duplicated, and which systems have the best structure for extending. They are then planning to extend systems to deliver all the capabilities that were previously duplicated. By analyzing and harvesting the important business logic from each, companies can more easily merge the relevant pieces of each system into one without building an entirely new system.

CW: In the course of retooling their systems for Y2K, have a lot of users had the foresight to build in e-commerce-type capabilities?

MOORE: That's an excellent question. And I must say that early adapters—the Y2K folks who worked on these projects early enough—fixed their systems more strategically than the laggards. In many cases, they cleaned up their code, eliminated redundant code, developed appropriate test environments and documented their systems and their efforts appropriately. Some of them used repositories to store critical system information which could be used later for such things as data warehousing or new systems development.

CW: As a result of their foresight, what current advantages do those companies have?

MOORE: Those companies are now in a great position to leverage these Y2K legacy renewal efforts.

They've got the base, and their code is structured and lends itself to componentization. They've got information about the code and its relationship with the data. They also have documentation. This means in some cases that they will be able to separate the presentation logic from the application and data access logic. So, for example, if they just want to replace their existing interface and rewrite it in Java, they are able to strip away the old interface logic and implement new logic.

CW: What other critical issues are there to consider?

MOORE: Skills are another big issue. Most companies have in-house IT staff with skills, such as COBOL programming capabilities, that allow them to maintain and develop their legacy assets. Many companies, however, do not yet have Internet/Web development skills, or distributed application development skills. As a result, building an e-business system from the ground up in an entirely new environment is extremely difficult because they need to either acquire these skills, or retrain their legacy programmers. This will add additional costs as well as time to any e-business development project.

CW: What does all this cost?

MOORE: It really depends on the projects, and the projects are so diverse. What I consider interesting about many of these projects—particularly the interface redesign or extranet types of projects—is that they are not extremely expensive, they do not require legions of programmers and they are very quickly implemented.

CW: If you could only give one piece of advice for people who are in the position of trying to leverage their legacy systems in the e-business world, what would it be?

MOORE: Identify your business driver and your business goal. Then, map that goal to some of the technologies that are available. There are a lot of vendors out there pushing point solutions and point tools. And, many of these technologies are good. However, you need to know your requirements before you even begin to investigate whether the solutions are suitable for your organization. ■

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Editorial by: **COMPUTERWORLD**
ENTERPRISE BUSINESS SOLUTIONS

William Ulrich of Tactical Strategy Group says:

CHALLENGE YOUR OUTSOURCING VENDORS

To fully capitalize on an outsourcing contract, you may need to re-evaluate the factors that motivated your decision to outsource in the first place.

Are you offloading an IT function that has become a headache? Are you seeking multi-year cost reductions? Maybe management wants to refocus on core competencies that no longer include IT. Tactical factors should not be pursued to the exclusion of long-term opportunities. Define how you want to leverage IT and challenge your outsourcing vendors to get there.

Outsourcing vendors offer value beyond lowered aggravation levels and short-term cost savings. Opportunities for leveraging vendor agreements are often overlooked. Consider a five-year maintenance contract, inked in 1996, that shifted support to an outsourcing vendor. Typical service level agreements (SLAs) from that era omitted language dealing with the Year 2000 issue.

As a negotiated solution to this dilemma, one vendor sent systems offshore to be fixed. The code was returned riddled with errors, forcing the vendor into a last-minute remediation project. The client, the vendor and the client's customers were exposed to risks by this short-sighted decision.

You face two key challenges when crafting an outsourcing contract: to anticipate changes in the business and technical landscape and build these changes into the SLA; and to consider personnel issues. Say a company wants to hire consultants to maintain its Cobol systems while launching an in-house project to web-enable key business functions. It makes more sense to build the web-enabling requirement into the maintenance contract and transfer in-house personnel to the vendor's payroll. This approach gives the vendor the skills to maintain the existing systems and the knowledge needed to web-enable the legacy environment. The vendor gains the flexibility and economies of shifting skilled personnel into areas where they are best suited. Meanwhile, a project originally

designed to dump a maintenance head-ache now delivers bottom-line value to your company.

Outsourcing vendors can offer tactical and strategic value under a single SLA. Short-term deliverables include re-documented systems,

rationalized data definitions, a data warehouse and web-enabled functionality. Long-term value includes redesigning core data structures, transforming architectures into web-oriented environments and replacing legacy systems with packages.

Many vendors segregate outsourcing, ERP, Internet and other services into separate offerings. But creating a comprehensive RFP that integrates a set of requirements should address this issue. If you challenge vendors to provide comprehensive solutions to short-

and long-term requirements, they will respond. All you have to do is ask. ■

William M. Ulrich is president of Tactical Strategy Group, Inc., strategic planning consultant, author and co-chair of the BrainStorm Group's SMARTsourcing and YEAR 2000 conferences.

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Silverline Technologies, Inc. "Silverline" is a leading provider of global information technology services and solutions. The Company offers a broad range of IT services, with the ultimate goal of being its clients' "partner of choice". Silverline's service offerings include: (i) application development and maintenance; (ii) system re-engineering & migration; (iii) turn-key project management; (iv) technical staffing; and (v) product customization. The Company delivers these services to a variety of technical environments including client servers, mainframes, year 2000 ("Y2K") solutions, internet/web development, products and enterprise resource management systems ("ERM").

The Company has a proven track record of building mission-critical applications for its clients. Silverline's clients depend on effective software development and system implementation to respond to highly varied requirements that meet changing regulations, schedules, and cost constraints. The Company considers its seamlessly integrated offshore development model in conjunction with its "value chain" business model to be its key strategic advantage. The Company's operations in India enable it to provide accelerated and more cost-effective software development and maintenance through 24 hours a day, 7 days a week ("24/7") availability of software developers.

The offshore capability gives Silverline the ability to offer its clients efficient pricing structures while maintaining high levels of quality which over time build strong relationships and grow revenues. With its focus on (i) banking, (ii) financial services, (iii) and telecommunications, the Company's business strategy is to ultimately become a virtual extension of its clients' existing IT department, providing comprehensive IT solutions through a seamless development and project management environment.

Headquartered in Piscataway, NJ, the Company has more than 1,000 employees worldwide. Additionally, Silverline maintains two U.S. offices: Oakbrook, Illinois and New York, New York. The Company's offshore software development centers are located in Mumbai, Thane and Chennai in India. These facilities are all connected via Silverline's dedicated state-of-the-art satellite link with internet, voice, video conferencing and data connections.

A BORDERLESS ENTERPRISE... (Continued from page 3)

turning to outsourcing is that the tools are already built, they are replicable and they are proven solutions. It's just a matter of customization. The third reason is that the end-user organizations don't know what kind of response to their e-commerce programs they are going to experience. Therefore, they like the out-sourcers, the vendors who work in this space, because they have the ability to scale very quickly, to increase capacity if needed when a company takes off.

Think strategically.

Push the limits of the envelope.

CW: Is it a likely that people will outsource initially and then hire people to run their e-business systems internally after they are up and running?

Bace: That could be one solution, once companies discover that e-commerce is a critical part of their business. Other people are looking to stick to their core businesses and never really acquire that kind of capability in-house. One vendor told me about a start-up airline in the southwest part of the U.S. that has an IT department of only five people. They are virtually outsourcing everything. Not only are they getting the tickets and reservations done, but they're also doing e-commerce by selling tickets over the airwaves.

CW: It seems like a pretty daunting task to assemble all the right components into an outsourced e-business development team.

Bace: It is a daunting task and there are some horror stories that are already coming out about firms that enjoyed a wonderful Internet Christmas last year. They developed a Web presence, they sold some items on the Web, and they increased their brand recognition, which was good. But their systems were literally reduced to producing a sheet of paper that somebody had to manually enter into their backend order-entry system. There were additional problems with some of these new systems, in that they disrupted enterprise logistics forecasting systems. This happened because they were not used to dealing in one-sies and two-sies-type orders.

CW: What advice would you have for users who are on the cusp of moving into this area?

Bace: Think strategically. Push the limits of the envelope. Don't just Webify a catalog or an order entry system. You have to move well beyond

that to reach the things that can change the way you do business.

CW: What advantages, if any, are there in sitting back a year and waiting for advances in e-business technologies and methodologies?

Bace: There are none. As a matter of fact, it could be substantially damaging to the health of your enterprise. Internet time is what society's business runs at today, and the organization needs to move quickly—but if necessary, in

smaller steps. There is a need to rapidly prototype a pilot and then move it into production after it's proved itself. If you sit back and wait for the dust to settle, the dust will probably settle on top of you. ■

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A solid blend of consulting and IT skills has made Satyam one of the fastest growing IT solutions providers in the world. In just 10 short years, Satyam has built a network of more than 4,300 IT professionals operating out of offices and state-of-the-art development centers in the United States, India, Japan, Singapore, and the United Kingdom.

Satyam's professionals work hand-in-hand as IT partners with more than one hundred clients worldwide, 22 of which are Fortune 500 companies. The company's technical experience extends into developing, implementing and maintaining specific business applications to implementing and supporting enterprise-wide solutions for a variety of industries, including banking, insurance, manufacturing, telecom, healthcare, software and high-tech organizations.

Satyam is one of only ten companies in the world to achieve Level 5 assessment of the Capability Maturity Model (CMM) instituted by the Software Engineering Institute (SEI) of Carnegie Mellon University. CMM-SEI Level 5 is considered one of the most sought after global quality assessments in the software industry. At Level 5, the highest stage, an organization is characterized as continuously improving the range of its process capability and the performance of its projects.

This commitment to excellence is further exemplified by Satyam's trademark way of doing business, known as RightSourcing. The methodologies of RightSourcing are simple, yet effective: Put the right service and the right solution in the right place at the right time. This means IT projects are conducted at the client site, at a Satyam development center or at a combination of both, and are always customized to meet a client's current and future IT needs.

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Cognizant Technology Solutions Corporation is a leading applications outsourcer that provides software development and maintenance services for Fortune 1000 companies. Cognizant partners with its customers to handle full life-cycle application development projects, and takes full responsibility for on-going maintenance of client systems and legacy transformation. Cognizant's core competencies include legacy and client/server systems, web-centric applications, data warehousing and component-based development.

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To ensure that their work is of the highest quality, Cognizant utilizes its ISO 9001 certified QView methodology to define and implement projects; and in December 1998, Cognizant became one of only 18 software engineering organizations worldwide to be assessed at SEI/CMM Level 4.

Using Cognizant facilities, customers can undertake additional projects without investing in new hardware or software and can parallel-process development phases to accelerate delivery.

Cognizant Technology Solutions Corporation is a subsidiary of IMS Health, the leading provider of information solutions to the pharmaceutical and healthcare industries worldwide. Global revenues in 1998 were \$58.6 million. Originally formed in 1994 as the in-house technology development center for The Dun & Bradstreet Corporation, the company was named Cognizant Technology Solutions in 1996, when Dun & Bradstreet formed the Cognizant Corporation to provide insight into three fast-growing sectors: healthcare, media and technology. With the continued growth of these sectors, Cognizant Technology Solutions made an initial public offering in June 1998 (NASDAQ:CTSH). In July 1998, Cognizant Corporation evolved into two separate entities: Nielsen Media Research and IMS Health. IMS Health retains a controlling interest in Cognizant Technology Solutions.

Headquartered in Teaneck, New Jersey, Cognizant Technology Solutions now has seven offshore software development centers in Madras (4), Calcutta (2), and Pune (1), India. Cognizant also has sales and business development offices located in Chicago, San Francisco, Toronto, Canada and London, England.

E-SOURCERS MOVE CLOSER... (Continued from page 7)

Bala: In my view there are very few leading edge companies today in industries such as financial services, that have the requisite in-house expertise. E-sourcers are positioned to provide needed expertise over the next three years as demand explodes. Companies are responding to their needs by either acquiring 'soup to nuts' outsourcing services such as an ASP, or building an Internet strategy, which requires them to develop their Web infrastructure or an e-commerce infrastructure, leveraging the help of 'best of breed' e-sourcers. Most large and even mid-size firms require the services of an Internet integrator and in our view given the paucity of tested talent (and Y2K preoccupation), e-sourcing is almost mandatory for every company this year. Very few companies have the right skill set internally, especially in the area of developing a competitive web strategy.

CW: What is the timeframe for the projects that are being e-sourced?

Bala: We're looking at projects that could span from six weeks to three months at the low end, to perhaps a year or two at the high end. Typically the longer lifecycle projects are broken into manageable parts, and there is perhaps a clearer understanding of deliverables and costs. It's also an iterative approach to delivery that starts separating the 'doers' from the 'talkers', and there usually is a greater appreciation for shared risks and rewards with the Internet integrator, working hand-in-glove with the both customer's technology function and lines of business.

CW: Describe more aspects of e-sourcing.

Bala: Continuing on to Internet integration. We're not talking about an operating environment, we're talking about a project environment starting with developing a Web site and putting an e-commerce application in place. Or, the e-commerce application may already be there and tested. Either way, the value of the implementations are not really there until applications are integrated back to the technology and people infrastructure—including data marts and data warehouses—as well as the bread and butter operational systems such as human resources, finance and manufacturing. Firms also intrinsically become more valuable when e-sourcers help integrate—using the web—those implementations into their cus-

tomers' customer and supplier's technology and people infrastructure.

CW: E-business is a rapidly moving target. What questions should you ask potential e-sourcing partners?

Bala: You definitely want to know what their experience

base is. Many of the newer, innovative companies have fairly limited integration experience, but their experience is very well focused in the areas of Web development or e-commerce application development and maintenance. Don't count out deep client-server or legacy skills in mainframe technolo-

gies. It's important to know what the industry-specific experience is. It's important to know if they have an understanding of your business strategy within the context of your industry. They should also understand your competition. The management consultative and business architectural elements are much more deeply infused with the actual implementation than was in the client/server and main-

frame legacy regimes. You might have business and technical strategies being offered by separate consulting companies in the past, but the prospective e-Sourcer has to have both. Technical depth/bench, practice and/or data centers and financial viability would be important elements of due-diligence. Price would be lower down the list. ■

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Electronic Whiteboards

Capture your marker strokes

BY HOWARD MILLMAN

WHEN YOU NEED to transmit visual information to a group of people, don't ask them to write and listen to you at the same time. With an electronic whiteboard, you can write it down for them. Electronic whiteboards significantly add to the versatility of traditional whiteboards by automatically capturing the information

that you write, converting it into an electronic signal and transmitting it to an attached computer as a graphical image.

Buying one makes the best sense if you do a lot of ad hoc brainstorming that prevents you from preparing your material in advance. However, if you can use slides or overheads, do that instead of using an electronic whiteboard. It will cost less and look better, and fewer things can go wrong.

I tested electronic whiteboards from Virtual Ink Corp.

and MicroTouch Systems Inc. and found both easy to use and even fun, sort of like a giant Etch-A-Sketch. Virtual Ink's Mimio and MicroTouch's Ibid boards achieve the same result, but they do it in considerably different ways.

In my opinion, the Mimio is a clear winner because of its small size, light weight and ability to transform any hard surface into an electronic whiteboard in seconds.

"Virtual Ink made using electronic whiteboards

practical, especially for work-group-level collaboration, where the users are remotely located," says Mike Comisky, an analyst at International Data Corp. in Framingham, Mass. "Before the Mimio, the boards were cumbersome, sometimes difficult to calibrate and just not worth the effort."

If you travel, I strongly recommend Virtual Ink's clever Mimio because of its easy portability. It weighs less than 2 lb. and folds into a compact, 12-in.-long cylinder. MicroTouch's Ibid 50, its new 1- by 2-ft. portable unit, weighs a shoulder-sagging 12 lb. and doesn't fold. For intrabuilding use, when bulk or weight isn't so much of a factor, the Ibid 50 is a suitable choice. ▀

Millman is a reviewer and consultant in Croton, N.Y.

GETTING STARTED with MicroTouch's Ibid whiteboard is a bit easier than with Virtual Ink's Mimio – you just start drawing. No assembly is required



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www.virtual-ink.com
\$499

Virtual Ink's Mimio, unlike MicroTouch's Ibid, isn't actually a whiteboard. It's a 24-in.-long "capture bar" that attaches to an existing whiteboard – or any flat, hard surface – with suction cups. I attached the Mimio to a piece of opaque glass, and it worked fine. A 10-ft. cable connects the capture bar to a computer's serial port.

The Mimio performed well; the writing on the whiteboard is captured accurately and almost instantaneously on the screen (a surface of up to 4 by 6 ft.) and in the marker color you select.

If the computer is on a network, you can send the information to other computers. Or, using Microsoft Corp.'s NetMeeting, you can send it to other users over the Internet in real time. For larger groups, you can route the signal through the computer into a projector to display it on a screen up to 24 ft. high.

The Mimio uses infrared and ultrasonic sensors to capture your hand motions as you write on the board. You use the Mimio's special marker jackets that slip over standard colored markers and change them into signal-generating devices. You activate the signal by pressing on the marker's tip as you write on the whiteboard. The color of the ink depends on the color of the jacket.

Mimio's software works much like a simple drawing program. It's easy to install, learn and use. It enables you to modify, save and print images. Installation of the software and configuration of the bar take about 15 minutes.

Ibid 50

MicroTouch Systems Inc.
www.microtouch.com
\$499

Unlike the Mimio, the Ibid 50 is actually a board. As you write on its touch-sensitive surface, its embedded electronics capture your pen strokes and send them as commands to the computer. The unit attaches permanently or temporarily to a wall or will sit on an easel, which is optional.

Getting started with the MicroTouch whiteboard is a little easier than with the Mimio – you just start drawing. There is no assembly required. As with the Mimio, the Ibid whiteboard transfers data almost immediately to the computer screen and allows excellent control over its appearance.

For example, you determine the color of the text sent to the computer by just pressing a color key on the unit's control panel.

Models are available in a variety of sizes, up to a 4- by 6-ft. unit that lists for \$2,499.

However, the standard Mimio can scan the same size board and costs one-fifth as much. If you plan to share the data on the board with colleagues at their computers, think carefully about how large a board you want. Yes, you can fill 24 square feet with text and graphics, but think how Byzantine that would look when shrunk to fit a 17-in. computer screen.

The Ibid software is similar to the Mimio software. Both display the familiar Microsoft interface, with a menu bar and tools bars that duplicate the control panels on the whiteboard. You can save and print, as well as cut, copy and paste. But remember, the data you're manipulating isn't text; it's an image, which lessens its usefulness.



VIRTUAL INK'S MIMIO isn't a whiteboard at all. It's a 24-in.-long "capture bar" that attaches to an existing whiteboard

Tool Command Language

BY FRANK HAYES

FROM ITS NAME, the Tool Command Language (Tcl) may sound like it belongs with the saber saw and the electric drill. But a glue gun is probably a better image. This free scripting language has proved itself a handy way to string together existing applications — and may have an even stronger future on the Web.

Unlike conventional programming languages such as Cobol and C++, Tcl wasn't designed for building large, fast, compute-intensive programs. Instead, a Tcl program — called a script — routes data from one program to another. The larger, faster programs do the heavy lifting; the Tcl program ties them together.

Creating Value

"The ability to leverage existing programs means you can create a lot of value with something small and efficient written in Tcl," says John R. Rymer, president of Upstream Consulting in Emeryville, Calif.

The programs that Tcl can leverage include relational database managers from Oracle Corp., Sybase Inc. and Informix Corp. and command-line programs that can input and output text. And because Tcl was specifically designed as a "glue" language

— not intended to write large, stand-alone programs — developers have created a wide variety of Tcl extensions for functions such as generating graphs, charts and 3-D graphics.

Tcl's most widely used extension is a graphical user interface (GUI) tool kit — called Tk for short. Tk includes buttons, menus, scroll bars and other graphical widgets. The 500,000 to 1 million programmers who use Tcl with Tk — according to the trade group The Tcl/Tk Consortium — can create GUI-based programs that serve as front ends to other programs or string together several programs.

In fact, the same Tcl script written using Tk will look like a Windows application on a PC, a Macintosh application on a Macintosh and a Motif program on a Unix workstation.

There's a price to that flexibility, of course. Like other popular scripting languages, including Perl, JavaScript, VBScript and Rexx, Tcl is an interpreted language. The computer must decode and execute a Tcl program one line at a time, so it runs more slowly than a program written in a compiled language such as C++.

But Tcl programs can be written quickly, says Phil Costa, an analyst at Giga Information Group Inc. in Cambridge, Mass. "It's a good way to tie together different systems or to do quick hacks that don't require the ultimate in performance," he says.

No Number-Crunching

In addition, Tcl wasn't designed for manipulating numbers, and its simple design makes complex program logic difficult to create. "For things like transactional capabilities or business rules, you need other languages," says Joshua Walker, an analyst at Forrester Research Inc. in Cambridge, Mass.

On the other hand, Tcl is simple enough that it can be built directly in to more complex applications, to serve

DEFINITION:

Tool Command Language (Tcl) is a programming language designed for writing scripts that link existing programs. The Tcl tool kit is an extension that lets programmers create graphical interfaces for Tcl scripts for Windows, Macintosh and Unix operating systems.

as a scripting language.

Another key advantage for Tcl is the language's ability to handle text input. That has made Tcl popular for use in

generating images and pages on the fly on the Web.

And that capability may make it still more popular in the future, thanks to Extensible

Markup Language (XML). XML is a textual format for data, points out Rymer. And as XML grows in importance, Tcl should grow right with it. ▀

Q&A

Scriptics CEO John Ousterhout Talks About the Tcl Scripting Language

Tcl creator John Ousterhout, who is CEO of Scriptics Corp. in Mountain View, Calif., spoke with *Computerworld* about the strengths and weaknesses of the programming language.

Why did you create Tcl? Aren't there enough computer languages already?

I originally created Tcl as a command language for applications my graduate students and I were building at [the University of California at] Berkeley. What I wanted was an interpreted language that could be embedded inside an application and meld with the features of the application to provide a powerful command-and-extension language. Furthermore, I wanted to be able to use the same basic language in many different applications. There was no existing language that could serve this purpose, so I created Tcl.

What makes Tcl better than other scripting languages?

Tcl's greatest strength is its ability to work with devices or applications to control them, automate them and integrate them with other resources. This comes from two key features of the language: embeddability and extensibility. I mentioned embeddability before. Extensibility means that Tcl provides [programming interfaces] you can use to create new features in the language by writing code in C, C++ or Java. People have written thousands of extensions for Tcl, such as Tk, and hundreds of these are available freely on the Internet.

Embeddability and extensibility

make Tcl a wonderful platform for automating and integrating things. It's easy to put Tcl anywhere, [to] create extensions that allow Tcl to communicate with things you want to control, then write Tcl scripts to automate those things and integrate them with other things in your environment.

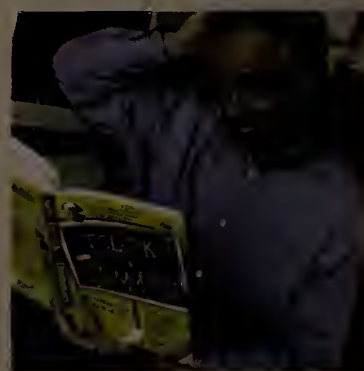
One of Tcl's distinctive features is the Tk tool kit, an extension that allows you to create graphical user interfaces [GUI] by writing Tcl scripts. People have found that they can create GUIs five to 10 times faster with Tcl/Tk than with other approaches.

Any notable drawbacks?

I'd like to see lots more Tcl extensions, such as interfaces to [enterprise resource planning] systems. Tcl could also use better development tools. Until a few years ago, there were essentially no development tools for Tcl. At Scriptics, we've created a tool set called TclPro, which is a good start. But even more tools are needed in the future, such as performance analysis tools, test coverage and a graphical interface builder for Tk.

What kinds of practical applications is Tcl being used for?

Tcl is used for a huge variety of applications, but most of them have an integration flavor. On the Web, Tcl is used at high-end Web sites such as AOL's Digital City and Travelocity, where it creates dynamic Web pages



John Ousterhout is no dummy when it comes to Tcl — he created it

by integrating content from a variety of sources. One of my favorite applications is at NBC, where Tcl is at the heart of their new digital broadcast control system: It fetches programming schedules from corporate databases, mixes different regional feeds and controls video storage hardware, transmission channels and satellite uplinks and downlinks.

Whom is Tcl for? Can it really be used by nonprogrammers?

Tcl is probably the easiest scripting language to learn. Often, what happens is that programming wizards create a Tcl-based system by writing extensions or embedding Tcl in an application. Then more casual programmers write Tcl scripts for that system. For example, at AOL the casual programmers are Web content creators; at Cisco, the casual programmers are test engineers; and at Motorola, the casual programmers are factory automation experts. — Frank Hayes

AT A GLANCE

Tcl Resources

www.tclconsortium.org

The Tcl/Tk Consortium, a nonprofit group promoting Tcl/Tk

www.scriptics.com/resource

Scriptics Corp. Tcl Resource Center

www.sco.com/Technology/tcl/Tcl.html

The Santa Cruz Operation Inc. Tcl Info page

Tcl and the Tk Toolkit

Addison-Wesley, 1994. The definitive description of the language by Tcl creator John Ousterhout

MOREONLINE

For more information about Tcl, visit our Web site.

www.computerworld.com/more

Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.

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PLOTTING AN OPEN-SOURCE PATH

Although open-source software can be a low-cost, flexible choice for IT organizations, opponents are quick to point out the limited support and lack of applications

By Christopher Lindquist

THOUGH IT CAN sound like tech talk for flower children or the coding equivalent of communism, open-source software can make good business sense if information technology managers are careful to weigh the pros and cons before starting a project.

Many companies make widespread use of open-source products — free software developed under a license that guarantees that users also get access to the source code — sometimes without realizing it. The Apache Group Web server, the Perl development environment and sendmail e-mail software are all open-source programs used by thousands of corporations. When it comes to open source as a corporate strategy, however, some companies may get edgy.

Open Source Defined

Part of the problem is that open-source software is often mistakenly confused with freeware. It's true that many open-source packages are free, but the two terms mean very different things.

Freeware doesn't provide access to source code, nor are users authorized to modify the product without permission from the author.

Definitions of *open source* vary somewhat, but in general, it means that a program's original source code must be freely available to anyone who wants it. Stricter definitions state that software can be called open source only if its license allows users to redistribute the software at no charge — though they don't prohibit charging for support or consulting services.

Open-source software may have humble, group-project roots, but it has produced some worthwhile products — including Linux. And an unusual license shouldn't be a reason to avoid it. "Software is software. If it does your job, and it works, then it's acceptable," says Greg Weiss, research analyst at D.H. Brown Associates Inc. in Port Chester, N.Y.

Weiss also notes that open-source licenses, in general, work more in favor of users than against them. "You really only have difficulties when you want to modify the [code] and redistribute it," he says. "Most companies aren't doing that."

Of course, the open-source community urges that you release any changes you make, even if you don't plan to redistribute the code. But once you get past the Sociology 101 language used by some adherents, there are compelling reasons to consider a move to open-source products.

The Reasons Why

Open-source advocates have a long list of reasons why it makes good business sense to consider open-source products. Among them are the following:

- **Cost:** Open-source programs are usually free, though you'll have to pay for things like printed manuals, telephone technical support and consulting — if such offerings are even available — from the vendor.
- **Peace of mind:** Many companies like knowing that they have the source code to critical software in hand. If the vendor goes under, you still have some chance of making patches and updates to the code.
- **Security:** Arguments rage, but fans say that because many people have access to open source code, security holes are usually plugged in hours or days, not months, as can happen with traditionally licensed products from companies that may have overworked staffs who put bug fixes on the back burner.
- **Flexibility:** Need a new feature? With open source code, you can write it yourself instead of waiting for it to be added to the vendor's list of future upgrades.
- **Support:** The open-source community makes exceptional use of communications media like e-mail and

Usenet. If you have a question, it's likely to be answered with a search of the newsgroups. And as open source increases in popularity, large vendors such as IBM and Dell Computer Corp. in Round Rock, Texas, have begun to offer support options. Around-the-clock support organizations have begun to crop up.

The Reasons Why Not

Many commercial software vendors are quick to point out that open-source software does have its downsides, which include the following:

- **Delayed development:** It's common for large vendors to get together and discuss future product plans years in advance of actual delivery. So when new hardware features like Universal Serial Bus (USB) or the IEEE 1394 (Firewire) bus arrive, supporting software usually hits at the same time or soon after. Open-source developers have yet to get in on the action. Only a handful of hardware makers offer Linux drivers, for instance. And Linux has yet to offer support for USB or complete compatibility with Plug and Play.
- **Hazier future:** Software developed by a consensus of part-time programmers is unlikely to ever have the razor-sharp focus on the future that you'll get from a company like Microsoft Corp. Open-source software tends to follow trends: As developers find a use for something, they add the code. Commercial software can help define trends by creating uses and anticipating problems before customers even know they exist.
- **Security:** The other side of the security debate is that with open source, a hacker could theoretically integrate dangerous code into a product and redistribute it to unknowing customers. This could be a problem with less popular products that aren't under the same scrutiny as things like Linux and Apache.
- **Support:** Commercial IT vendors have long offered around-the-clock support contracts and certification programs. And if you need someone trained in Oracle8 or Windows NT 4, you can find one by calling any local technical school. Only a few open-source vendors have begun such services, and it's unclear how successful they'll be in the long term.
- **More limited ease of use:** Open-source programs are created by developers — often for developers. As a result, graphical user interfaces and convenient configuration and administration tools often aren't available.
- **Few commercial applications:** This argument is commonly aimed at Linux by Microsoft fans: There are far fewer commercial applications designed for use on open-source platforms, thereby limiting options when companies look for off-the-shelf products.

Decision Time

A move to an open-source product can't be taken lightly. Support is still sketchy compared with more established commercial software. Initial cost savings can be offset by other, less tangible expenses. For example, complete, off-the-shelf software packages for Linux are harder to come by than for Windows NT.

The trade-off can be time, says Weiss. "[Linux is] cheaper as an [operating system], but are you going to spend 10 hours digging up all the tools you need and getting them compiled and running for you?" he says.

If so, it — and other open-source programs — may not earn their keep. But, he adds, "when Linux does something equally well, the question is: Why would you pay for another operating system?"

For more information, check OpenSource.org for definitions, case studies and a history of open-source software. Articles also appear at Slashdot.org.

Lindquist is a freelance writer and reviewer in Moss Beach, Calif.



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C++ Success Story

Competitors have predicted its demise, but use of C++ continues to grow

BY TOM DUFFY

SOME OF THE BEST creations happen by accident. Others are the result of diligence and impressive foresight. Put C++, which Bell Labs first offered to universities in 1985, in the latter category.

In 1979, a Bell Labs researcher named Bjarne Stroustrup wanted to write some simulation programs for himself

slow. Basic Combined Programming Language (BCPL) didn't have the abstraction facilities he felt were needed. C, which was derived from BCPL, had the same limitations.

So Stroustrup decided to write a new version of C, which he called "C with classes." The language evolved and became more sophisticated, and in 1983 Stroustrup dubbed it C++.

From the outset, Stroustrup was determined that C++ achieve wide acceptance, according to Andy Koenig, a colleague of Stroustrup's and the author with Barbara Moo of *Ruminations on C++*. As a result, Stroustrup constructed C++ so

that it compiled into C rather than into machine language. That allowed it to be used by anyone who already had a C

compiler, of which there were hundreds of thousands in circulation.

"Compiling into C made it possible for him to make it widely available," says Koenig. Bell Labs first made C++ available to university users in 1985, with virtually no support. To get the word out, Stroustrup simultaneously published a book, *The C++ Programming Language*, which is now in its third edition.

It didn't take long for the language to find an audience. In 1987, 200 people attended the first C++ conference. The following year, more than 600 people attended, according to Koenig. By the early 1990s, Stroustrup estimates, the number of users was in the vicinity of 500,000, making C++ the world's fastest-growing computer language.

The beauty of C++ is that it allows programmers to make increasingly complex programs with ever more simple interfaces, according to Koenig. Today, C++ is the dominant object-oriented programming language and is the basis for

software applications for everything from PCs to supercomputers. C++ has been written into AT&T Corp.'s transmission, switching and operations systems and is also behind much of the company's WorldNet Internet service.

Stroustrup, meanwhile, continues to work at AT&T Bell Labs, where he is head of the Large-Scale Program Research department and is heavily involved in the further evolution of his language.

"I remember three or four years ago somebody from Sun said that Java was so fantastic that he expected C++ to be dead in two years," says Koenig. "Now it's three years later, and the number of C++ users is still increasing." He says he attributes that to the fact that "you don't have to have a whole stable of tools, one for X and one for Y. It's a tool that is more than good enough for a wide range of applications." ▀

Windows Arrives

Despite a slow start, Microsoft claims market leadership

BY TOM DUFFY

The concept of windowing technology was born in a Xerox Corp. laboratory in the mid-1970s. But it took Microsoft Corp. to popularize it.

Windows was released in late 1985, more than a year after it was due. But it didn't arrive without problems. Version 1.0 was initially sluggish, primarily

because most of the installed base of computers didn't have enough power to run it. In addition, Windows required the use of a mouse, which most computer users weren't familiar with yet, and that contributed to lackluster sales.

There were other windowing technologies on the market at the time, notably IBM's TopView. But by 1987, when IBM announced it would begin selling Windows, it effectively conceded that Microsoft had won the competition for the operating environment.

Microsoft's eventual success with Windows secured its place as the dominant software company it is today. ▀

Duffy is a freelance writer in Northampton, Mass.



BJARNE STROUSTRUP, the creator of C++

and some friends. Simula67, which Stroustrup considers the first real object-oriented programming language, was too

that it compiled into C rather than into machine language. That allowed it to be used by anyone who already had a C

1985

Steve Wozniak leaves Apple Computer Inc. to teach computing. Steve Jobs also leaves Apple following a dispute with then-CEO John Sculley. Jobs starts Next Computer Inc.

Quantum Computer Services is founded by James V. Kimsey, Marc Seriff and Steve Case (at right) in Vienna, Va. The company launches Q-Link for Commodore Business Machines Inc. computer enthusiasts. Q-Link is a network dedicated to chat, e-mail and games. Case is quoted at the time as saying, "We knew simplicity was the key. We had to divorce ourselves from some technology gobbledygook to strike a chord with



Main Street." Quantum later becomes America Online Inc.

The National Center for Supercomputing Applications is established at the University of Illinois, Urbana-Champaign. Director Larry Smarr lobbies Congress to create four supercomputing centers around the country, linked by a high-speed network. The network will displace Arpanet as the driver in Internet development when

Congress approves the funding.

Four other national supercomputer centers are formed in San Diego, Pittsburgh, Princeton, N.J., and Ithaca, N.Y.

Whole Earth Catalog publisher Stewart

Brand starts an electronic forum called The Whole Earth 'Lectronic Link, a.k.a. The Well.

Intel Corp. releases the 386 micro-

processor. It features 275,000 transistors, more than 100 times as many as the original 4004.

Atari Corp. releases Gauntlet, a video game for multiple players.

Inmos Corp., the state-backed U.K. semiconductor company, launches the Transputer - a microprocessor specifically designed to be linked to other microprocessors for use in parallel processing.

Lotus Development Corp. releases Jazz, an all-in-one software package for the Macintosh that incorporates spreadsheet, database, graphics, word processing and communications applications. Jazz is expected to be the key to acceptance of the Macintosh in business but turns out to be a commercial flop.

Aldus Corp., founded by Paul Brainerd (at right), releases PageMaker, the first desktop publishing program for



PCs. PageMaker can be used to write text, produce layouts, create illustrations and print documents or books.

Phrack, an electronic journal dedicated to hacking, is launched.

Robert Palmer joins Digital Equipment Corp. He becomes CEO in 1992.

Michael Cowpland founds Corel Corp.

Nintendo Co. introduces the home Nintendo Entertainment System.

By the end of the year, there will be 2,000 Internet hosts.

The Tomy Kyogo Co. releases the Omnibot 2000, a 26-in.-tall robot that can move in two

speeds, greet visitors, pour drinks and carry objects.



Cray Research Inc. introduces the Cray-2 (at left), dubbed the world's fastest and most-powerful computer. The sites at which it is used include a NASA facility at Moffett Field in California and the University of Minnesota Supercomputing Center, which are placed on Arpanet.

Symbolics.com is assigned the first registered domain on March 15. Other firsts are cmu.edu, purdue.edu, rice.edu, css.gov and mitre.org.uk.

Dr. Jack Copeland implants a Jarvik-7 artificial heart in Michael Drummond.

Abbott Laboratories produces the first licensed test to detect the HIV virus.

- Compiled by Laura Hunt



Web-To-Host Connectivity, You Control

You need to grant host access to a broad range of users, including employees, customers and suppliers. But host access must be secure and centrally controlled. Learn how Winsurf Mainframe Access from ICOM Informatics gives your users simple, browser-based host connectivity while you maintain centralized control of host resources from wherever you happen to be.



CONCURRENT MULTI-HOST ACCESS:
IBM, AS400, DEC, Unix.

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Love at First Sight

Philadelphia, the City of Brotherly Love, opens its arms to IT pros looking for big-city challenges at a saner pace
By Kim Fulcher Linkins

AFTER LIVING and working in New York for 20 years and dealing with a fast-paced, energetic, hectic lifestyle, Karen J. Hanson had had enough. She says the day after day of such a frenzied pace was exciting, but also draining. So she looked to make a change. Her search brought her to Philadelphia, the City of Brotherly Love, where the hand of friendship that Philadelphians extended to her helped her to call Philadelphia home.

"I think that we have the sophistication in terms of the IT challenges that you will find," says Hanson, project director at Greater Philadelphia First Corp. "We're world-class IT in Philadelphia, but I think that the environment that you do it in is a lot more family-friendly and a lot more work/personal life-balanced than you would get in New York."

Kenneth A. Nelson agrees with Hanson's assessment. The senior vice president and CIO at Aramark Corp., a food distribution company, describes the area's work environment as high-energy, results-oriented and pretty hard-paced. "If you're a person who wants to learn a lot quickly and get a lot of good exposure to a lot of good technology, and you're in a growth mode, I would think [Philadelphia would] appeal to you," he says.

The Philadelphia area has many of the same needs for information technology professionals as the rest of the U.S., experts say but specifically



THE LIBERTY BELL: just one of Philadelphia's historical landmarks

needs people with Internet or Web specialties; object-oriented program development, Java, C++, Unix and Windows experience; Oracle database development skills; programming abilities in all languages; experience with integrated applications like SAP; e-commerce skills; and LAN and other networking skills.

Room to Grow

The hottest growth market in the area is for Internet developers. According to May's "Delaware Valley IT Hiring Survey," three of every four companies surveyed say they are looking for Internet developers, with 71% paying \$50,000 per year or more. Specifically, the survey reports that programmers who can compile programs in Java are in huge demand, with salaries running at \$70,000 per year or more in the area. The survey was conducted by the Triad Group at Texcel Inc., a recruiting firm specializing in finding qualified job candidates in IT.

IT professionals from various backgrounds should be able to find their niche.

"Greater Philadelphia is home to Fortune 500 companies, it's home to midsize companies, it's home to tiny start-ups," Hanson says. "I think that appeals to a lot of people, because you want to do different things at different points in your career."

Historically known for manufacturing, Philadelphia's economy has diversified in recent years to include industries such as insurance, financial services, chemicals, pharmaceuticals and biotechnology.

Many companies in the area are in a holding pattern until they can see how the year 2000 problem will work out.

"I predict that SCT Corp. will return to a more aggressive hiring pattern [that's] normal for the IT industry within the next year," says Susan Knoble, SCT general manager for workforce development. "Once Y2K has come and gone, we will see the market begin to shake loose, and sales should rebound strongly." Then, Knoble says, companies should be hiring IT workers at all levels.

For leisure time, there are plenty of recreational opportunities in Philadelphia. "Even in just the New Jersey, Pennsylvania and Delaware tristate area, you have the convenience of

the seashore to take your children, you have a lot of amusement parks and museums, a lot of history in terms of Independence Hall and learning all about the Liberty Bell and our freedom," says Arlene Milano, project leader for SAP upgrades at Elf Atochem North America Inc.

In order to retain good employees, Hanson says, companies in the area are trying to help their employees maintain a balance in work and life.

Programs vary by company and can include in-house day care, telecommuting programs, flexible work schedules, tuition reimbursement, adoption reimbursement, unpaid medical leave and even a concierge service to help employees get personal tasks done during the day, such as dry cleaning or shoe repair. ▀

Linkins is a freelance writer in Austin, Texas. She can be reached at KPLinkins@aol.com.

Sixty Miles From Philly: Atlantic City



THE ATLANTIC CITY BOARDWALK provides a workday diversion

If the history, job opportunities and attractions of Philadelphia still don't do it for you, a 62-mile drive southeast will take you to Atlantic City, which some information technology professionals say offers IT work in a vacation spot.

Donald Kneisel, executive director of MIS at Tropicana Casino and Resort, says, "There's something to be said about living in a resort area."

Gaming is Atlantic City's major industry. Ron Banez, a consultant at Showboat Casino and Hotel, says most of the casinos in Atlantic City are running AS/400s as their main platform. Therefore, there's a strong need for AS/400 skills. IT professionals skilled in Windows NT, server-based applications, programming and networking are also in demand.

A unique aspect of working in IT

in Atlantic City is the need to be licensed by the state casino commission. "It involves disclosing some information to the state, and then they do a background check on you," Kneisel says. "If you have skeletons in your closet, they will come out."

"Basically, any employee that deals with gaming has to be licensed by the state casino control commission," he says.

Banez says he has found the salaries for IT positions in Atlantic City to be approximately 15% to 20% lower than in Philadelphia.

Kneisel says it's a quality-of-life payoff: "It's kind of a big-town business in a medium-size town," he says. "Besides, where else can you go to the beach at lunch time and still be back at work on time?"

— Kim Fulcher Linkins

But Will You Love the Pay?

Average annual salaries for IT staffers in Philadelphia based on years of experience:

JOB TITLE	1-3 YEARS	3-4 YEARS	4+ YEARS
Network administrator/analyst	\$43K	\$54K	\$58K
Project manager, systems and programming	\$53K	\$67K	\$73K
Senior systems analyst	\$45K	\$61K	\$63K
Senior systems programmer	\$43K	\$52K	\$59K
Senior programmer/analyst	\$42K	\$48K	\$56K
Programmer/analyst	\$38K	\$46K	\$50K

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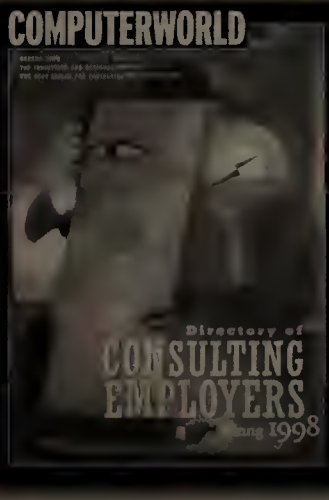
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SOFTWARE ENGINEER to analyze, design, develop, test, implement and maintain application software for enterprise wide client/server systems using Oracle database, Oracle Forms 4.5, Developer 2000 tools, PL/SQL, programming on UNIX and Windows NT operating systems, database administration, data modeling and performance tuning of Oracle databases. Require: Bachelor's degree (or equivalent) in Computer Science or Engineering with five years experience in the job offered or as Software Analyst/Application Developer or any experience providing skills in above duties. 40 Hours/week, 8 am to 5 pm, M-F. Salary: \$63,000 per year. Mail resume to: Human Resources Manager, Design Data Systems Corporation, 13830 58th Street N., Suite 401, Clearwater, FL 33760.

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With 2 years of industry experience to design and develop software applications. Excellent communications and a Bachelor's degree required. Fax resume to: (508) 836-3284 or email jobs@newgeninc.com

RSG Systems is seeking for Comp Consultants to migrate large-scale PB client/server apps to internet, to dvlp websites. Req'd 1 yr exp w/SQL Server, Site Server, PB. Mail res to: RSG Systems, 18 Baldwin Farms North, Greenwich, CT 06831.

Meena Systems are looking for Comp Consultants to dvlp web-based apps, test & maintain syst, create & configure dbases. Req'd Master's Comp Sci/Eng/Math & 1 yr exp w/SQL Server, PB, Win 95/NT. Mail res to: Meena Systems, 241 Asylum St, Ste 5 Hartford CT 06103

Systems Analyst, Boston, MA: Design, develop, implement, test and analyze financial system applications using Java, JFC, C++ and SQL; Provide technical support to the users on Unix and Windows Platform. Req'd. Bachelors in Comp. Scie. or Engg. 2 yrs exp in job offered 40hrs/wk, 9:00 am-6:00pm, \$1,800/wk. Submit two (2) copies of his/her resume in response to: Case #1998 2099, P O Box 8968, Boston, MA 02114.

Asst. VP - Sr. Programmer/Analyst (Oracle D/base) wanted by Commercial Bank in New York City. Must have Masters in Comp Sci, Comp Appls or Comp Engg and 2 yrs exp dsngng, testing, documenting & implmtg logical & physical d/bases & networked d/base access applcs using Oracle, case tools, PL/SQL & ODBC sids under UNIX OS; dvlpg web-based access to d/bases using Lotus Notes & Java Script s/ware; Sr. tech auth. for project prog. & delivery. Respond to: Shirley Cooper, Republic National Bank of NY, 452 Fifth Ave, New York, NY 10018.

Technology Consultant - Provides tech. consulting on UNIX, Oracle, networking, TCP/IP, and storage technology to clients in multiple industries within the U.S. southern & central states. Reqs. an M.S. or equiv in EE, CS, info Systems Mgmt, or rel field, plus industry experience. Position is based in MD. Resumes to: HR, Compaq Computer Corp., 129 Parker St., PK03-2/31K, Maynard, MA 01754-1418.

Information Technology Manager needed FT by a Co. dealing with Manufacture & Sale of Specialty Chemicals in McIntyre, GA. Must have 7 yr Computer Consultant/Systems Analyst exp with at least three (3) yrs. supervisory exp. with engineering and manufacturing systems implementation, Full System Life Cycle, Client/Server development and implementation, LAN/WAN, AS/400, Windows NT, Novell, AIX, Statistical Process Control software, XBASE development, 4GL and Oracle. BS in Comp Sci, MIS or related field req'd. Respond to: HR Dept, Engelhard Corporation, 1277 Dedrick Rd., McIntyre, GA 31054.

Software Engineer: Dsgn, dvlp & implmt s/ware systms for sophisticated business s/ware pkgs specific to IBM mainframes usng UNIX, ES-9000 & ES-9672 to provide tech support in operating systms internal; dvlp & direct testing in Natural 2.2, Predict, JCL, TSO, ISPF, ADABAS, VS Cobol II, DBE and CICS. Reqs 2 yrs exp in job offd or 2 yrs exp in related position w/ same duties & MS in Electronics, Engg, Comp Sci or a related field. \$78K/yr. EOE. Send resume to: Shiva Systems, 902 Spring Cir., #107, Deerfield Beach, FL 33441.

Programmer/Analyst needed F/T by Manh. Insurance Brokering Co. Must have 2 yrs exp analyzing, dvlpg, modifying, testing, implmtg & maintaining Developer 2000 system using Oracle, MS Access, PL/SQL & SQR Tools. Respond to: HR Dept, Kaye Insurance Associates, Inc., 122 East 42nd St, NY, NY 10168.

Programmer/Analyst sought by Computer Consulting Co. in Manh, NY. Must have 2 yrs exp analyzing, dsngng, dvlpg, testing, implmtg, & maintaining custom s/ware systems using ORACLE, PL/SQL. Respond to: HR Dept, Vittech Systems Group, Inc, 404 Park Ave South, 5 Fl, NY, NY 10016.

Systems Analyst needed by Software Sales & Consulting Firm in New York City. Must have BA or BS in Comp Sci, Math or Engg and 2 yrs exp installing, training, customizing & consulting on Great Plains S/ware, and implmtg ISAM & SQL Server Acctg Products into PC's & N/works. Respond to: HR Dept, AKA Vision, Inc, Attn: Jack Ades, 875 6th Ave, Ste 1610, NY, NY 10001.

Programmer/Analyst wanted by Malvern, PA Co involved in Dvlpmnt & Mktg of Pharmaceuticals. Must have Masters or equiv in Comp Sci, Math, Statistics or related field to dsng & dvlpg comp based systms used to support Clinical Research. Respond to: HR Dept, Sanofi Pharmaceuticals, Inc, 9 Great Valley Pkwy, Malvern, PA 19355.

Development Engineer wanted by Education Information & Services Provider in Princeton, NJ. Must have BS or equiv in Comp Sci or related field and 1 yr exp using Java, Netdynamics, SQL flavors, MS Active Server Pages, VB, MS SQL Server, PL/SQL and RDBMS. Respond to: HR Dept, Peterson's, 202 Carnegie Center, Princeton, NJ 08543-2123.

Programmer Analyst needed F/T by Comp S/ware systms dvlpmnt in Nashua. Must have 1 yr exp analyzing, dsngng, dvlpgng applic systms using C++, Java, FORTRAN, UNIX, WIN NT/95. Masters in Comp Sci, Engg or Math needed. Respond to: HR Dept., Visionsoft, 131 D.W. Highway, #662, Nashua, NH 03060.

Systems Analyst: Perform analysis, design and implementation of projects using Unix, C, Visual Basic and Power Builder. Bachelors in Eng., or Bachelors any field with 1 year tr'g in computer applications, and 1 year experience on the job or as Programmer Analyst. Apply with two copies of resume to H.R. Department, Comp-U-Max, LLC, 26 Route 46 East Lodi, New Jersey, 08764.

Software Solutions Inc., a leader in Client/Server and Web Technology, seeks a Software Engineer to develop distributed client/server applications for banking clients. Masters in Computer Science & 4 yrs. exp. as Software Engineer, Programmer/Analyst or in an Applications development occupation req'd. Exp. w/ORACLE, UNIX, Rational Rose, OOA, OOD, and OOP using C++ req'd. Send Resumes to: Vimal Kakkar, Software Solutions Inc., 96 Parker Road South, Plainsboro, NJ 08536.

Software Engineer wanted by Mfr of Semiconductor Proc. Eqpmt in Beverly, MA. Must have MS in Electrical Engg and 3 yrs engineering experience. Respond to: HR Dept, Eaton Corporation, 108 Cherry Hill Dr, Beverly, MA 01915. Attn: Peg Coughlan.

Systems Consultant needed by Consulting Service Co. for Computers & Networks in Miami, FL. Must have Bach in Comp Sci or Systems Analysis and 4 yrs exp. Respond to: Comsys International Corporation, P.O. Box 523853, Miami, FL 33152-3853.

Senior Associate Client Server Consultant needed by California based comp consulting Co. for job loc in Atlanta, GA. Must have 3 yrs System Analysis/Client Server exp. Skill set: SQL, Visual Basic, C/C++, Oracle. Respond to: HR Dept., NexGen SI, 30 Corporate Park Plaza #410, Irvine CA 92606.

Programmer Analyst sought by IT Consulting Firm in Bloomfield, NJ. Must have 2 yrs exp dsngng & dvlpg new applcs to meet business reqmts. Bach in Comp Sci req'd. Respond by resume to: HR Dept, Team D.P., Inc, 53 Golf Rd, Bloomfield, NJ 07003-3118.

Programmer Analyst wanted by IT Co. in Union, NJ. Must have 3 yrs exp in Oracle dvlpmnt bldg systems using Pro*C, PL/SQL & SQL*Forms. BS deg in Computer Science req'd. Respond by resume to: HR Dept, Patel Consultants Corporation, 1525 Morris Ave, Union, NJ 07083.

Patel Consultants Corp., an IT Co. in Union, NJ seeks to fill the following position:

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Programmer-Analysts needed in VA for NJ IT Co with exp. to design/develop/test & analyze software applications using C++, Java, CORBA, OOA, OOD, and UNIX. Apply to Global Consultants, 601 Jefferson Rd, Parsippany, NJ 07054.

Software Engineer needed in PA for network design, systems analysis, & configure client servers. Apply to J. Kealy, Universal, 4 Greentree #205, Lincoln Dr. Rt. 73, Marlton, NJ 08053.

Systems Analysts needed by IS/IT Professional Consulting Service in Teaneck, NJ for client locations throughout the US. Must have Bachelor's in Comp. Science, Engg., or Math and 2 years software experience. Respond to: Ref. #3028, HR Department, Cognizant Technology Solutions, US Corp., Glenpointe Centre West, Teaneck, NJ 07666.

Programmer/Analyst: Research, develop, design comp programs to meet end-users requests. Analyze user request for new/modified apps/programs re: feasibility, cost/time req, compatibility w/ current systems, comp capabilities. Analyze/modify/enhance programs/apps to increase operating efficiency. Prep tech manuals/train end-users. Use C, C++, UNIX, Visual Basic, Win NT 4.0, FTP, TELNET, ORACLE, JAVA, HTML. Job is in Orlando, FL. Req: 2 yrs exp, \$37,960/yr, 40hrs, 9am-5pm. Submit resume to: Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302-0869. Re: JO# - FL 1993616.

DATABASE ADMINISTRATOR Ensure the continual operations of the Branch SYBASE RDBMS systems running in a UNIX environment and its associated hardware. Req's Master's Degree in Computer Science, 4 yrs experience in Database Admin/Systems Admin, experience with SYBASE & UNIX. Send resumes to Byron Yu, Semaphore, Inc. 3 East 28th Street, 12th Floor, New York, NY 10016.

Senior Software Engineers. Develop & direct software programming, documentation & sys testing procedures for software program applications. Req. MS in technical field (comp. sci, IT, math, engineering, physics, etc) & 3 yrs exp as a developer or tech leader or a BS in a technical field & 5 yrs exp as a developer or tech leader. Exp. to include at least 6 mths with full life cycle development using PowerBuilder, Microfocus Cobol, or C++. \$60K and up. Resumes to: J. Lurey, Manhattan Assoc., 2300 Windy Ridge Pkwy, 7th Fl N., Atlanta, GA 30339

SYSTEMS ENGINEER Amdocs is a leading developer of software solutions for the telecommunications industry. More than 2,800 computer professionals serve our customers on five continents and in more than 10 languages. Now is a great time to talk with Amdocs. We're growing. We're seeking team players with strong technical and personal skills for positions in our Tucker, GA office: **SYSTEMS ENGINEER** - Must have BS in Comp Sci, Eng'ng or related field & working knowledge of COBOL, SOL, UNIX & Windows NT attained either through education or coursework. Please contact: Amdocs, Inc. Attn: Amos Galon, Job Number 74, Timberlake, Ga.

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SOFTWARE ENGINEER to design, develop, test, implement, maintain, support and customize software for various applications using C, C++, Pro*C, Oracle, Developer 2000, Forms, Reports, SQL, PL/SQL, SQL*Loader and ReportWriter under Windows 95/98/NT, UNIX and MS-DOS operating systems. Require: M.S. degree in Computer Science/Engineering, or a closely related field, with two years of experience in the job offered or as a Programmer/Analyst. Extensive travel on assignments to various unanticipated client sites within the U.S. is required. Salary: \$60,000 per year, 8:00 am to 5:00 pm, M-F. Send resume to: Jack Patil, President, Americus Global Software, Inc., 1900 The Exchange, Building 200, Atlanta, GA 30339, Attn: Job PK.

Software Engineer to design, develop & implement business process applications relating to Data Warehousing in a UNIX/Windows NT environment using ORACLE as a relational database management system (RDBMS). Re-engineer existing software applications to client server architecture using C & GUI tools such as PowerBuilder. Utilize SQL query optimization & PL/SQL for data loading/aggregation. Document enhancements & modifications & provide technical support. Min Req: M.S. in computer Sci. or equivalent plus one year of exp. Exp. to include the use of UNIX, Oracle, C, PowerBuilder. Salary: 80,000/yr and 40 hrs/wk. Must have legal authority to work in the U.S. Send resume to Root Consulting, 1500 Market Street, 12th Flr East Tower, Philadelphia, PA 19102 or Root Consulting 120 Wood Ave. So., Suite 501, Iselin, NJ 08830.

SOFTWARE ENGINEER to design, develop, implement, maintain and support business applications software systems using Oracle RDBMS, PL/SQL, Designer 2000 and Visual C++ programming languages and tools under UNIX and Windows 95 /NT platforms. Require: Master's degree in Computer Information Systems, Business Administration, or a closely related field with 6 months of experience in the job offered or in the related occupation of Software Consultant; Extensive paid travel on assignments to various unanticipated client sites within the U.S. Salary: \$69,500 per year, 8:30 am to 5:30 pm, M-F. Send resume to: Sherry D. Lucki, GM, Intellimark, 1211 Semoran Blvd., Suite 341, Casselberry, FL 32707. Job: VS.

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SOFTWARE ENGINEER to design, develop, implement, test and maintain software systems in mainframe and client-server environments using C, C++, JCL, VSAM, COBOL, IMS and DB2 under Windows 95/98/NT operating systems. Require: M.S. degree (or equivalent) in Computer Science, an Engineering discipline, or a closely related field, with one year of experience in the job offered or as a Programmer/Analyst. A B.S. degree with an additional five years of progressively responsible experience in the field will be considered equivalent to a M.S. degree; Full or part-time equivalent experience gained before or after earning degree will be accepted. Extensive travel on assignments to various client sites within the U.S. is required. Salary: \$60,000 per year, 8:00 am to 5:00 pm, M-F. Send resume to: Jack Patil, Americus Global Software, Inc., 1900 The Exchange, Building 200, Atlanta, GA 30339; Attn: Job SK.

Software Engineer (Atlanta, GA) Design, develop, test & maintain ENCORE group of software products consisting of Lobby, Platform, teller, Sales & Service and Banking Tailoring applications using Visual Basic as front end with compatibility to Microsoft access /SQL Server/Oracle back ends; administer the Oracle database using Instance Manager, Scheme Manager, Data Manager, Storage Manager, Backup Manager and Security Manager utilities and troubleshoot, install and support encore products for QA department. Must have Bachelor of Science Degree, or foreign degree equivalent, in Computer Science or related field, and 2 yrs experience in job offered, or 2 yrs experience as Software Consultant. Must have proof of legal authority to work in the U.S. Salary \$60,000 yr. Submit resume to: Carina Le, Human Resources, 400 S.W. Sixth Avenue, Portland, OR 97204 (Fax: 503/790-9293).

Multiple positions for IT professionals with NJ based IT firm as follows:

Software Engineers: Masters in CS or Eng., with 2 year exp., as a Software Engineer or as a Programmer Analyst; Bachelors in C.S., or Eng., with 5 years exp., as Soft Eng'r or as a Programmer Analyst

Programmer Analyst: Bachelors in Eng., or Bachelors any field with 1 year tr'g in Software Development, and 1 year experience on the job or as Systems Analyst.

Various skills combinations required: Sybase, Power builder, MS-SQL, Oracle, Visual C++, Windows NT etc. Apply with two copies of resume to: H. R. Department, Neotech Solutions, Inc, 3830 Park Avenue, # 207, Edison, NJ 08820.

Programmer Analyst - Must have BS in Computer Science, Eng. or Math with at least 3 years of experience in software system analysis & development. Must be proficient in SAP R/3 tools, SAP ABAP/4, EDI and IDOC. Must be willing to relocate throughout the US for varying periods of time. Will translate information from project specifications & procedures to create or modify computer programs; Information gathering & data validation; monitor performance aspects, support, and development. Install s/w, train users & prepare results, reports to increase s/w efficiency. Annual Salary \$114-135K depending upon experience and qualifications. Send Resume to: Abacus Talent Solutions, Inc., 411 South Ogden Street, Denver, CO 80209.

PROGRAMMER ANALYSTS BS/COMPUTER SCIENCE THE BOC GROUP

We are a multi-billion \$ Industrial Gas Co. with over 40,000 employees worldwide. Our headquarters in Murray Hill, NJ needs a Programmer Analyst. Qualified applicants will have a Bachelor's Degree in Computer Science & 2 yrs of relevant exp. Experience must include C and/or C++ & object-oriented paradigm. Must have experience with relational database management systems and SQL. Duties include developing client-server applications for supporting the distribution of liquid gases. Qualified analysts will work in all phases of the Software Development Life Cycle including analysis, design, programming/coding, testing & rollout support. Work as part of a team of programmers and analysts serving a global business community. Must have the ability to communicate effectively with users and work in a team environment. International travel is required. Competitive salary & excellent compensation package. Please send resume (no calls please) to BOC Gases, 575 Mountain Ave. Murray Hill, NJ 07974. PLEASE REFERENCE CODE JC/PA EOE. MFVD.

Needed Senior Business Analyst (Financial Applications) for our Pennsylvania and New Jersey locations to provide functional expertise in customization / implementation of Computer Software for Financial Applications; Analyze user functional requirements and redefine them into functional specifications; Design/develop Multi-Dimensional Analysis of Financial Data using On Line Analytical Processing (OLAP) Business Intelligence (BI) tools - Cognos Impromptu and Powerplay etc. High Mobility. Min. Req: Masters degree in Finance with one year experience in job offered or two years experience (before, during or after degree) in related areas of finance, of which at least one year experience should be in one of the following: RDBMS (Oracle), OLAP BI Tools (Cognos - Impromptu and Powerplay) or PeopleSoft (General Ledger). Company Certification / Training in the above packages will also be accepted in lieu of the one-year experience mentioned above. Salary: 100 K /Yr. and 40 hrs/wk. Must have legal authority to work in U.S. Send resume to Root Consulting, 1500 Market Street, 12th Flr, East Tower, Philadelphia, PA 19102 or Root Consulting, 120 Wood Avenue South, Suite 501, Iselin, NJ 08830.

Systems Consultant
Prov. services in design & dev. of business systems & applications to support sales, purchase orders, receipts, shipping, inventory & warehousing activities, using IBM AS/400, RPG/400, CL/400, SQL/400, RLU (Report Layout Utility), SDA (Screen Design Aid), Synon 2/E, & JD Edwards case tools; develop modules, convert applications from archaic systems to JD Edwards & AS/400 environment; maintain JD Edwards programming standards, design conversion programs, complete system specs & implement modules to print bar-coded worksheets & shipping tags; upload data to AS/400 using ODBC driver; generate log reports & write queries to download data from AS/400 to EXCEL spreadsheets. \$75,000/yr. 40 hrs/wk. B.S. in Computer Sc., Computer Eng., Math, Business Admin. or Commerce. B.S. may be foreign equiv. degree. 2 yrs. exp. req'd in job offered or 2 yrs. related exp. as Sr. Systems Analyst or Programmer Analyst, or Systems Eng., to include use of notated skills in job duties. Will work at unanticipated locations in the U.S. Send 2 resumes or apply to the GA Dept. of Labor, Job Order #GA6419593, 1535 Atkinson Rd., Lawrenceville, GA 30043-5601 or the nearest Dept. of Labor Field Service Office.

ENGINEERING

OPPORTUNITIES

Senior Software Engineer

Responsibilities include specification, design, development, implementation and testing of Integrated Service Digital Network (ISDN) call processing and signaling applications in an embedded system environment. Responsible for the execution of new product development from concept to manufacturing release, the engineer will work with both North American and International variants of ISDN to make products compatible with both domestic and international markets. Must have experience with telephony and datacomm software development and with product development environment such as VxWorks RTOS and Tornado.

Software Engineers

We are also seeking an engineer interested in taking responsibility for specification, design, development, implementation and testing of a Graphical User Interface (GUI) for a Web based element application management. Engineer will work with product development, customer support, product management and quality assurance to maintain and enhance GUI features. Development will be done in an NT environment using JAVA, HTML, JAVA APIs and JavaScript.

Please send your resume to: **K. Turner, Castle Networks, Inc., One Executive Drive, Chelmsford, MA 01824; Fax: (978) 848-0399; Email: kturner@castlenetworks.com.** No boundaries: only possibilities - an Equal Opportunity Employer. Principals only please.

More Information Is Within Your Reach @
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Software Instructor - ERDAS IMAGINE. Teach a range of courses in the ERDAS IMAGINE software to resource, military, academic and public sector clients. Assist in the development of training documentation for all ERDAS IMAGINE training programs. Provide instruction in remote sensing, image processing, geographic information technology and photogrammetry. Design new photogrammetric course material with real world applications. Develop and maintain an appropriate level of product knowledge through attendance at training courses and outside study. Represent company at various trades shows, User Group Meetings and Distributor Meetings. Perform acceptance testing on new software. Perform client/prospect demonstrations. Req.: Bachelor's (US or foreign) in Cartography, Geography or Earth Sciences and 2 yrs. exp. providing software instruction. Experience, which may have been obtained concurrently, must include 2 yrs. of exp. providing instruction in ERDAS software; 2 yrs. exp. working in the photogrammetry industry; and 1 yr. of exp. working with UNIX. Some international travel will be required. 40 hrs/wk. Send resume to Sheila McShane, ERDAS, Inc. 2801 Buford Highway, Suite 300, Atlanta, Georgia 30329

Computer Support Specialist: Entry level position in White House Tennessee to provide technical support to computer systems network in main office & two branches. Develop & maintain operating systems, develop custom programs for jobs costing, jobs estimating, cash flow analysis and creating spreadsheets using DBASE and Micro Excel; responsible for computer server system networking and a vendor/customer/employee database maintenance; make decisions on the system types based on the analysis of necessary hardware and software upgrades; recommend ongoing improvements on computer systems. Req. BS in mgmt. science and computer systems or related field. No prior exp. required. Must demonstrate ability to perform job duties through course work in: (1) Mgmt. Info. Systems; (2) Business Systems Analysis; (3) Database Mgmt.; and (4) Data Communication Systems. Apply to: HR Manager, C-Tech, Inc., 116 Portland Rd., White House, TN 37188

Banking
Major national bank holding company in Wilmington, Delaware, is interviewing for a limited number of openings in our Database/Statistics department.

DATABASE ADMINISTRATOR-Level 1
Must have a Bachelor's degree in business administration in a quantitative discipline or other quantitative Bachelor's degree and one year's experience as a database administrator or in a statistical or analytical position. Must have experience with ORACLE, UNIX Script, and SAS functions.

DATABASE ADMINISTRATOR-Level 2
Must have a master's degree in business administration in a quantitative discipline or other quantitative master's degree and one year's experience as a database administrator or in a statistical or analytical position. Must have experience with ORACLE, UNIX Script, C++, and SAS functions.

DATABASE ADMINISTRATOR-Manager
Must have a master's degree in business administration in a quantitative discipline or other quantitative master's degree and one year's experience as a supervisor in systems analysis. Must have experience with ORACLE, UNIX, SAS, and C++.

MODELING STATISTICIAN
Must have a master's degree in a quantitative discipline. Must have experience with SAS functions (Base SAS, SAS Stat, SAS Macro). Must be proficient in Excel and Powerpoint.

Competitive salary and benefits package offered. All resumes should be sent to NA6392135B, MNBA Corporation, 1100 N. King St, Wilmington, DE 19884-0195.

SYSTEMS ANALYST

Glaxo Wellcome Inc., one of the world's leading pharmaceutical companies, has an opening at its Corporate Headquarters located in Research Triangle Park, N.C. for an individual to design, develop, implement and support computer applications for our Commercial Operations Division.

Working with a team of programmer/analysts, individual will provide technical development/support for the Division's Integrated Data Warehouse. Will meet regularly with clients and developers to review production support issues/project requests and serve as a liaison to determine technical needs and support objectives. Individual will develop strategies to correct application problems; code and unit test program to enhance Data Warehouse applications; develop system documentation; design/develop DSS projects using ROLAP/DSS tools from MicroStrategy to enable end-user data analysis and data mining of the COIS Integrated Warehouse; and provide on-call support as needed.

Position requires a BS in Computer Science, Computer Engineering or a related field (U.S. or Foreign) and 2 years experience in computer system design/development. Background must also include 2 years experience supporting client/server applications in an Oracle environment; 1 year experience using C, PL/SQL, SQL*Plus, Oracle Database Administration/Oracle Form; and 1 year experience designing/maintaining projects using ROLAP tools from MicroStrategy.

For more information and to apply online, please visit our website at **www.glaxowellcome.com**. Search for Job ID # 7954 under career opportunities. If you do not have Internet access, or if you experience technical difficulties, call 1-888-825-5249, Monday thru Friday 8:00AM-8:00PM ET. (No agency referrals please) An Equal Opportunity Employer M/F/D/V

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PROGRAMMER ANALYSTS BS/COMPUTER SCIENCE THE BOC GROUP

We are a multi-million \$ Industrial Gas Co. with over 40,000 employees worldwide. Our headquarters in Murray Hill, NJ need a Programmer Analyst. Qualified applicants will have a Bachelor's Degree in Computer Science & 2 yrs of relevant exp. Experience must include C and/or C++ & object-oriented paradigm. Must have experience with relational database management systems and SQL. Duties include developing client-server applications for supporting the distribution of liquid gases. Qualified analysts will work in all phases of the Software Development Life Cycle including analysis, design, programming/coding, testing & roll-out support. Work as part of team of programmers and analysts serving a global business community. Must have the ability to communicate effectively with users and work in a team environment. International travel is required. Competitive salary & excellent compensation package. Please send resumes (no calls, please) to BOC Gases 575 Mountain Ave Murray Hill, NJ 07974. PLEASE REFERENCE CODE JC/PA EOE. MFVD.

Rayex, Inc., a Computer Services Co. in Skillman, NJ seeks to fill the following positions:

- Programmer Analyst - Must have Bach in Bus Admin or Finance & 1 yr exp planning, dvlp, testing & documenting comp s/ware for bus applies using RFG/400, SDA, PDM, Query/400 & SQL/400 on IBM AS/400 with OS/400.
 - Programmer Analyst - Must have Bach in Comp Sci, Comp Engg or Elec Engg & 1 yr exp planning, dvlp, testing & documenting comp s/ware using CL/400, COBOL/400, RPG/400 & SQL/400 on AS/400 machine with OS/400.
 - Programmer Analyst - Must have Bach in Comp Sci, Comp Engg or Elec Engg & 1 yr exp planning, dvlp, testing & documenting comp s/ware applies systems using VB, SYBASE & MS SQL Server in Windows & UNIX envrmts.
 - Programmer Analyst - Must have Bach in Comp Sci, Comp Engg or Elec Engg & 6 mos exp planning, dvlp, testing & documenting comp s/ware applies using PowerBuilder in SYBASE & ORACLE d/bases in Win envrmt.
 - Software Engineer - Must have Masters in Commerce or MIS & 1 yr exp analyzing, dsng & dvlp comp s/ware applies systems using SYBASE & MS SQL Server in Windows & UNIX envrmts.
- Respond to: HR Dept, Rayex, Inc, 102 Tamarack Circle, Skillman, NJ 08558.

Senior Software Engineer (multiple openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation using relational data base management systems (RDBMS). Work involves extensive travel and frequent relocation. Must have 1 year of experience using 1 from Group A and 2 from Group B OR 1 from A and 1 from B and 1 from C OR 1 from A and 2 from C. A) DB2, FoxPro, Informix, Ingres, MS-Access, Oracle, Paradox, Sybase and Unify; B) AIX, DOS, HP-UX, MVS, Novell, OS/2, Sun OS, UNIX, VAX/VMS, Windows; C) 4GL, APT, C, C++, COBOL, Case Tools, C Shell, Crystal Reports, E-SOL, Easytrieve, JAVA, ODBC, PowerBuilder, PowerDesigner, Power J, Power++, S-Designer, SOL, Shell Script, Visual Basic. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math, Physics or a scientific or business related field. Will accept Bachelor's degree or foreign equivalent plus five years of progressive experience as computer professional. Salary is \$70,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Ms. Charlene Cogley, Manager, Beaver Falls Job Center, 2103 Ninth Ave., Beaver Falls, PA 15010. Job Order No.: 9101139.

DATABASE ADMINISTRATOR Database Administrator to do logical and physical design of Oracle database; Code test and implement Oracle scripts applying knowledge of Database Management Systems; Calculate optimum values for Oracle database parameters; performance tune Oracle databases; Model Oracle database security; manage backup and recovery of Oracle databases; make changes to Oracle database applications using expertise in Oracle database administration which includes logical design, physical design, performance tuning, backup and recovery, coding of scripts, knowledge of Oracle 7.3, SOL *DBA, Pro *C (tools) and PL/SOL (Language). Requirements: Bachelor's Degree in Computer Science or related field and two years experience as a database administrator, expertise in Oracle database administration which includes logical design, physical design, performance tuning, backup and recovery, coding of scripts, knowledge of Oracle 7.3, SOL *DBA, Pro *C (tools) and PL/SOL (Language). Salary: \$70,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and relocation. Apply: Washington Job Center Manager, Millicraft Center, Suite 150 LL, 90 West Chestnut Street, Washington, PA 15301, Job No. 9101101.

Radiant Systems, Inc. a Nationwide Technology provider requires Computer Professionals with Hardware and/or Software skills including:

a. C, C++, Java, Java Scripts, Perl, HTML, SOL, Pro*C
b. Visual Basic, Visual C++, Gupta-SOL, Powerbuilder Crystal Reports, MFC, Windows SDK
c. Oracle, Informix, Sybase d. Unix, Windows NT, Windows 97, Real Time Embedded System HP-Unix, Admins, Sun OS, Help Desk/PC-Support
e. SAP, R/2-R/3, ABAP/4, SAP Scripts, JD EDWARDS, PL/5, PEOPLESOFT
f. COBOL/CICS/DBS, IDMS, AS/400, MVS, RPG/400
g. Win Runner, Load Runner, MS-Test, SOA Suite
h. CORBA, ASP
i. DSP/ATM, FRAME RELAY, TCP/IP, ISDN, COM, DCOM, ASP, SAS, DSQS, VS WORK, Assembly Acics, Designer, Hardware Architecture, VHDL, SONET/SDH, SNMP, HP Openview, Map Info/Arc Info Project Managers, Technical Writers.

Candidates w/a BS (or equiv) & 2 yrs exp. as Programmer Analyst and/or MS (or equiv) & 1yr exp. as Software Engineer.

Excellent Benefits
Apply to:
E-Mail:
RADIANTS@RADIANTS.COM
Attn: Human Res. Dept.
107 a Corporate Blvd. S.
Plainfield, NJ 07080

Senior Software Engineer - Oracle: analyze, design, develop and implement financial and business related software applications using Oracle Financials and other tools for multi-user/multi-site Oracle database systems; supervise other programmers and analysts; utilize Oracle software development tools such as Developer/ Designer 2000, Case Tools, SOL*Reportwriter, SOL*Forms, PL/SOL in UNIX and Windows. Requires one year experience as software engineer or programmer, or systems-analyst utilizing Relational Database Management System (RDBMS) Oracle 7.x, Developer/Designer 2000, SOL*Forms and PL/SOL to develop, program and implement financial/business software applications. Requires Masters in computer science, engineering, math, chemistry, physics, or business-related field (when skills involve Oracle); will accept equivalent to degree through Bachelors plus five years progressive experience which may include information technology and/or accounting/financial experience. Experience requirements may have been gained concurrently. Position involves extensive travel and relocation. Salary: \$75,000 year, 40 hrs/wk., 9am-5pm. Submit resume to: Ms. Barbara Cole, Supervisor, Greene County Team PA Career Link, 4 W. High St., Waynesburg, PA 15370, Attn: Job Order # 7054873.

Senior UNIX Systems Administrator NYC. Requires a Bachelor's degree in computer science and 4 yrs.' exp. in the job offered or in the engineering and architecture of UNIX systems. All stated exp. must have involved eng. and administration of SUN Microsystems hardware and systems software. Engage in the engineering and architecture of UNIX systems. Engineer and administer SUN Microsystems hardware and systems software. Engage in the support of all UNIX servers, including those that support Sybase, Web/Internet/ Intranet services and those that support production systems and development groups. Provide in-depth analysis of cross-platform problems and resolve related issues. Ensure efficient operation of all UNIX services and perform system monitoring and capacity planning as needed. Contribute regularly to the documentation of all UNIX security policies, configuration changes, upgrade issues and application support strategies. Document and maintain data procedures and any written reports in support of all components of the state-of-the art UNIX environment. 40 hrs./wk. 9:00-5:00. Send resume to: Alliance Capital Management L.P., Human Resources, 1345 Avenue of the Americas, New York, NY 10105.

Software Engineer: Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation using relational data base management systems (RDBMS). Work involves extensive travel and frequent relocation. Must have 1 year of experience in job offered or as a computer professional as well as 1 year using 1 from Group A and 2 from Group B OR 1 from A and 1 from B and 1 from C OR 1 from A and 2 from C. A) DB2, FoxPro, Informix, Ingres, MS-Access, Oracle, Paradox, Sybase and Unify; B) AIX, DOS, HP-UX, MVS, Novell, OS/2, Sun OS, UNIX, VAX/VMS, Windows; C) 4GL, APT, C, C++, COBOL, Case Tools, C Shell, Crystal Reports, E-SOL, Easytrieve, JAVA, ODBC, PowerBuilder, PowerDesigner, Power J, Power++, S-Designer, SOL, Shell Script, Visual Basic. Bachelors degree, or foreign equivalent, in Computer Sci/Apps, Eng., Chem., Math, Physics or a scientific or business related field. Salary is \$65,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Ms. Charlene Cogley, Mgr., Beaver County Job Center, 120 Merchant Street, Ambridge, PA 15003. Job Order No.: 2027675

Senior Software Engineer (3 openings): Design, develop and implement computer software systems to determine feasibility of design and directs software testing procedures, programming and documentation. One year of experience required using: 1 of Group A and 3 of Group B OR 2 of A and 2 of B as follows: Group A - Oracle RDBMS, Designer 2000, Developer 2000, Oracle Applications (Financials, Manufacturing - Order Entry & Inventory); Group B - Oracle Forms, Oracle Reports, SOL*Plus, Pro*C, PL/SOL, SOL*Forms, SOL*Reports. Work involves extensive travel and frequent relocation. Must have Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Will accept Bachelor's degree or foreign equivalent plus five years of progressive experience as computer professional. Salary: \$70,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Mr. Tom Rusnack, Manager, Charleroi Job Center, 10 Paluso Dr., PO Box 210, Charleroi, PA 15022, Reference: Job Order No. 1027477.

Software Engineer - Oracle: analyze, design, develop, implement and customize business-related software applications and systems using Oracle Financials/ Manufacturing and other software tools for Oracle systems; utilize Oracle development tools such as Oracle*Forms, Oracle* Reports, SOL*DBA, PL/SOL, PRO*C in UNIX and Windows. Requires one year experience as software engineer or programmer, or systems-analyst in implementing, installing and customizing Oracle Applications using Oracle Financials/ Manufacturing, Oracle, Oracle* Forms, Oracle*Reports, PL/SOL. Requires Bachelors in computer science, engineering, math, chemistry, physics, or business field (when skills involve Oracle); will accept foreign equivalent degree or equivalent through combination of education and experience using a 3:1 ratio of years of experience to education. Experience requirements may have been gained concurrently. Position involves extensive travel and relocation. Salary: \$65,000 year, 40 hrs/wk., 9am-5pm. Submit resumes to: Ms. Margaret Weckerly, ACT Manager, Butler County Job Center, 227 W. Cunningham St., Butler, PA 16003, Attn: Job Order # 8055076.

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CSC Professional Services Group, Inc. Virginia
Programmer/Analyst

Travel may be required. Salary DOE. Send ad & resume to Ad#: 31281-7, Attn: Patty McNally, 2100 East Grand Avenue, El Segundo, CA 90245. Please indicate specific title/location of job for which you are applying on your application letter.

Software Engineer (3 openings): Design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. One year of experience in job offered or as a computer professional as well as one year of experience using 1 of Group A and 3 of Group B OR 2 of A and 2 of B, as follows: Group A - Oracle RDBMS, Designer 2000, Developer 2000, Oracle Applications (Financials, Manufacturing - Order Entry & Inventory); Group B - Oracle Forms, Oracle Reports, SOL*Plus, Pro*C, PL/SOL, SOL*Forms, SOL*Reports. Work involves extensive travel and frequent relocation. Bachelors degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Salary: \$65,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Washington Job Center Manager, Millicraft Center, 90 West Chestnut Street, Washington, PA 15301. Reference: Job Order No. 9101165.

SOFTWARE ENGINEERS required. Design and development of systems level conversion software in COBOL and C to migrate programs and databases. Develop databases using Oracle CASE tools on mainframe and UNIX platforms. Masters degree required in Math, Computers, Engineering or any related field of study plus one year of experience in the job duties described above. Must have proof of legal authority to work in the U.S. Salary - \$70,000/year for a 40 hour work week. Apply at the Texas Workforce Commission, 1117 Trinity, Room 424T, Austin, Texas 78701. J.O. #TX0520386. Ad paid by An Equal Opportunity Employer.

Software Engineer: analyze, design and implement new and enhanced client/server graphical user interface (GUI) applications for database systems using Powerbuilder, SOL, and Oracle in Windows and/or UNIX environments. Requires one year experience as software engineer or programmer-analyst in design, development and implementation of GUI applications using Powerbuilder with Oracle and/or SOL in Windows or UNIX. Requires Bachelors in computer science, engineering, math, chemistry, physics, or business-related field (when skills involve Oracle); will accept equivalent to degree through education and experience using 3:1 ratio of years of experience to education. Experience requirements may have been gained concurrently. Position involves extensive travel and relocation. Salary: \$65,000 year, 40 hrs/wk., 9am-5pm. Submit resume to: Mr. Duane M. Brentzel, Manager, Greensburg Job Center, 599 Sells Lane, Greensburg, PA 15601. Attn: Job Order # 6027402.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in CGI, Java, Java Script and Oracle. Requirements: Master's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of CGI, Java, Java Script and Oracle. Salary: \$70,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Tom Dembosky, Indiana Job Center, 350 N. Fourth Street, Indiana, PA 15701, Job No. 8055019.

SOFTWARE ENGINEER
Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Visual C++, Image and COBOL. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Visual C++, Image and COBOL. Salary: \$57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. James Clark, Uniontown Job Center, 32 Iowa Street, Uniontown, PA 15401, Job No. 9101106.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in DB2/400, RPG 400 and Query/400. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of DB2/400, RPG 400 and Query/400. Salary: \$57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Duane M. Brentzel, Alle-Kiski Job Center, 3 Kensington Square, New Kensington, PA 15068, Job No. 6027378.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in UNIX, C and Network Programming. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of UNIX, C and Network Programming. Salary: \$57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Terry Kinney, Armstrong County Job Center, 1270 N. Water Street, PO Box 759, Kittanning, PA 16201, Job No. 1027453.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in DB2, CICS, VS COBOL II and Expeditor. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of DB2, CICS, VS COBOL II and Expeditor. Salary: \$57,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. Greg Schwing, Mon Valley Job Center, 345 Fifth Avenue, McKeesport, PA 15132, Job No. 8055021.

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SOFTWARE ENGINEER
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Systems Analyst (SAP HR Consultant). Multiple openings. Must have Bachelor's degree in computer science/studies with 2 yrs experience in SAP implementation, configuration and design. SAP experience must include human resources (HR), financial (FI), and ABAP/4 software development. Job involves implementation, configuration and design of SAP, HR and FI software to customers' requirements at customer sites, as well as designing and writing ABAP/4 programs. Send resume to John Taylor, President, Tempus International Corporation, 9914 Natick Rd., Burke, VA 22015.

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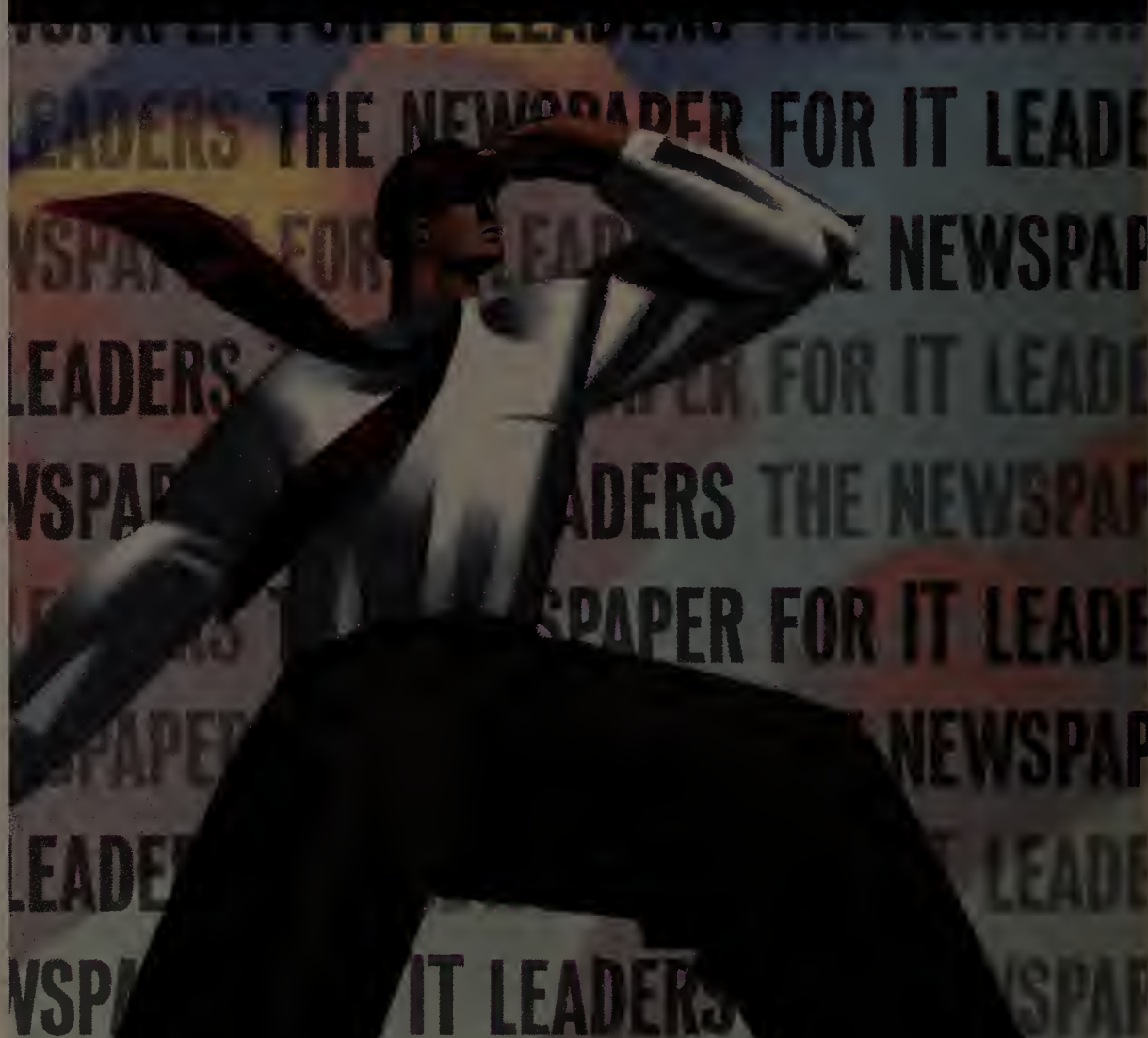
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Senior Software Engineer (3 openings): Design, develop and implement computer software systems using PeopleSoft and related software. Work requires extensive travel and frequent relocation. Must have 1 year of experience as a Senior Software Engineer or as a computer professional as well as 1 year of experience using PeopleSoft and related software. Masters degree in Computer Science/Applications, Engineering, Math, Physics, Chemistry or other scientific or a business related field. Will accept Bachelors, or foreign equivalent, with 5 years of progressive experience as a computer professional. Salary is \$105,000.00 per year, 9am - 5 pm.. Send resumes, referencing Job Order 9101150, to Mr. Terry Kinney, Mgr., Armstrong County Job Center, 1270 N. Water St., PO Box 759, Kittanning, PA 16201.

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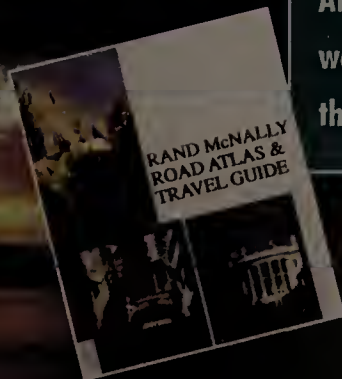
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Renaissance Worldwide (L)	-16.0
Tech Data	-11.5
Priceline.com Inc. (L)	-9.8
Harris Corp. (L).....	-9.5
Banyan Systems Inc.	-7.1
Sungard Data Systems	-6.7

DOLLAR

Comsat Corp.	-7.81
Priceline.com Inc. (L)	-6.41
Micron Technology (H)	-4.25
Tech Data	-3.56
Alltel Corp.	-3.31
GTE Corp.	-2.94
Xilinx	-2.94
Computer Sciences	-2.63

Gateway Aiming at Corporate Accounts

BY MATT HAMBLIN

IF YOUR company thinks of Gateway Inc. (NYSE:GTW) as just a place where consumers go to buy PCs, it might be time to think again. In recent months, the \$7.5 billion company not only has undergone a change in name (formerly Gateway 2000) and corporate address (from South Dakota to San Diego), but has taken steps to increase PC and server sales to large businesses.

Those changes, put in place a year ago, helped the company's stock soar to a year-high \$100 per share last week, prior to a stock split at the close of trading last Tuesday, analysts said.

Second-quarter earnings announced in July hit a record \$89 million, or 56 cents a share, up 47% from the same quarter last year. Gateway has been ranked third or fourth in PC sales in the U.S. in the past few quarters.

"We've rated the stock a Buy throughout the year because the company has done a number of very intelligent things," says Charles Wolf, an analyst at Warburg Dillon Read LLC in

New York.

Wolf says a promising factor for Gateway's future is its savvy in bundling PCs with service contracts from Gateway.net, its Internet service provider arm. The provider has 400,000 subscribers, double the number it had a year ago, making it the 11th largest. None of the other major PC makers have been as successful in bundling Internet service, he adds.

In July, Gateway announced an alliance with GE Capital Information Technology Solutions in Newport, Ky., to offer products and services for IT operations in large companies.

Although unproven, several analysts say the alliance looks promising. Gateway will build equipment to order for Fortune 1,000 companies based on advice from GE, which will also provide worldwide service.

Overall, consumer sales at Gateway made up about 46% of its revenue last quarter, with 10% coming from large businesses. By comparison, Dell Computer Corp. (Nasdaq:DELL) in Round Rock, Texas, sells about 85% of its products to businesses and institutions.

Gateway isn't known as a server vendor, but last week it attempted to beef up its profile in that area by offering the Linux operating system on its ALR servers. And the 180 Gateway Country stores are now being staffed with business account representatives who will help small and midsize businesses set up systems and networks.

"One of Gateway's weaknesses was they needed to raise the profile in the business segment, and they are," says Andrew J. Neff, an analyst at Stearns Inc. in New York. He also rates Gateway a Buy. ▀

INDUSTRY ALMANAC

Gateway Grows

Analysts rate Gateway a Buy because of new business and Internet efforts



EXCH	52-WEEK RANGE	SEPT. 10 2 PM	WK NET CHANGE	WK PCT CHANGE
SOFTWARE UP 10.1%				
ADBE	105.68-25.62	Adobe Systems Inc. (H)	104.38	1.00 1.0
ARBA	157.00-61.00	Ariba Inc. (H)	143.44	7.94 5.9
AZPN	28.00-6.12	Aspen Technology Inc.	9.44	1.25 15.3
ADSK	49.43-21.62	Autodesk Inc.	25.94	2.50 10.7
AVID	34.25-11.06	Avrd Technology	12.69	-0.25 -1.9
BMCS	67.38-30.00	BMC Software Inc.	67.38	11.25 20.0
BDBJ	54.63-6.12	Business Objects S.A. (H)	54.63	6.13 12.6
CDN	36.00-9.12	Cadence Design Systems	14.69	0.75 5.4
CBISY	59.62-6.68	CBT Group Plc.	27.94	5.94 27.0
CHKP	94.31-10.87	Checkpoint Software Tech. Ltd. (H)	94.31	10.94 13.1
CTXS	65.25-23.12	Citrix Systems Inc.	59.63	1.88 3.2
CDGN	28.12-14.75	Cognos Inc.	19.88	-0.13 -0.6
CA	59.00-28.75	Computer Associates Int. Inc.	59.00	3.94 7.2
CPWR	40.00-18.37	Compuware Corp.	30.56	1.06 3.6
DCIM	54.12-9.37	Documentum	18.06	2.08 12.9
EFIL	64.87-15.12	Electronics For Imaging	63.94	3.52 5.5
HNCS	45.62-13.75	Hnc Software	41.00	2.38 6.1
HYSL	36.12-9.87	Hyperion Software	20.25	0.97 5.0
IDXC	53.50-12.43	IDX Systems	20.50	0.00 0.0
INFA	64.62-19.00	Informatica Corp. (H)	62.81	7.63 13.8
IFMX	14.00-3.75	Informix Software Inc.	8.22	0.97 13.4
INTU	110.75-36.25	Intuit	105.63	13.56 14.7
JKHY	55.00-26.43	Jack Henry Associates	35.00	1.00 2.9
JDEC	49.50-10.87	J.D. Edwards & Co.	21.94	5.00 29.5
LGTD	50.13-13.75	Legato Systems Inc. (H)	50.13	4.50 9.9
MACR	53.25-12.62	Macromedia Inc.	46.25	2.00 4.5
MANU	17.37-5.25	Manugistics Group Inc.	14.06	2.06 17.2
MENT	15.06-5.43	Mentor Graphics	9.50	0.25 2.7
MSFT	100.75-43.87	Microsoft Corp.	95.00	0.13 0.1
NETA	67.68-10.06	Network Associates	20.19	2.19 12.2
GMH	63.87-30.37	Network General	54.63	4.63 9.3
NDVL	31.12-7.43	Novell Inc.	24.19	0.06 0.3
ORCL	45.63-13.93	Oracle Corp. (H)	45.63	5.06 12.5
PMTC	22.25-8.50	Parametric Technology Corp.	15.31	0.94 6.5
PSFT	34.75-11.50	PeopleSoft Inc.	18.13	3.94 27.8
PIXR	53.75-31.00	Pixar	37.13	3.19 9.4
RATL	40.00-10.87	Rational Software Corp.	35.00	5.50 18.6
RHAT	135.25-40.00	Red Hat Inc. (H)	123.13	41.13 50.2
SAP	51.75-23.75	SAP AG	39.00	5.44 16.2
SCUR	29.00-2.25	Secure Computing Corp.	2.69	-0.19 -6.5
SE	46.43-19.00	Sterling Commerce Inc.	20.81	0.31 1.5
SSW	30.62-18.12	Sterling Software Inc. (L)	22.81	2.69 13.4
SDRC	23.43-7.50	Structural Dynamics Research	16.81	0.88 5.5
SYBS	13.38-4.50	Sybase Inc.	13.38	0.38 2.9
SYMC	36.44-8.68	Symantec Corp. (H)	36.44	3.63 11.0
SNPS	63.88-26.93	Synopsis	63.88	4.38 7.4
SCIT	22.00-7.81	Systems & Computer Technology	16.13	1.13 7.5
BAANF	33.12-6.87	The Baan Co. N.V.	15.31	2.69 21.3
VNTV	15.81-5.00	The Vantage Corp.	9.50	1.25 15.2
TIBX	41.37-19.75	Tibco Software Inc.	33.94	2.94 9.5
TSAI	51.00-26.00	Trans. Sys. Arch.	30.06	0.06 0.2
VRTS	71.25-11.87	Veritas Software Corp. (H)	71.25	6.63 10.3
WIND	34.43-11.25	Wind River Systems Inc.	18.25	2.25 14.1

TELECOMMUNICATIONS CARRIERS UP 1.0%

AT	75.00-40.62	Alltel Corp.	68.38	-3.31 -4.6
AIT	77.25-43.37	Ameritech Corp.	61.25	-2.25 -3.5
ANDW	22.87-10.37	Andrew Corp.	16.94	-0.38 -2.2
T	64.12-35.81	AT&T	46.00	-2.06 -4.3
BCE	52.68-25.62	BCE Inc.	50.19	4.00 8.7
BEL	66.93-42.37	Bell Atlantic	62.56	-1.00 -1.6
BLS	51.37-32.81	Bell South	44.31	-0.31 -0.7
CSN	26.50-8.50	Cincinnati Bell Inc.	17.50	-0.88 -4.8
CMCSK	42.56-19.62	Comcast	36.69	1.19 3.3
CQ	39.62-27.00	Comsat Corp.	27.38	-7.81 -22.2
CDX	44.43-22.87	Cox Communications Inc.	39.94	3.63 10.0
GSTRF	33.00-8.31	Globalstar Telecom. Ltd.	25.88	1.00 4.0
GTE	78.50-46.56	GTE Corp.	68.69	-2.94 -4.1
NXTL	72.13-15.37	Nextel Communications (H)	72.13	11.88 19.7
SPOT	45.43-26.37	Panamsat	37.38	-0.38 -1.0
QCOM	198.62-18.87	Qualcomm	166.75	5.31 3.3
SBC	59.93-36.62	SBC Communications	47.19	-1.50 -3.1
FDN	54.73-29.75	Sprint Corp.	47.25	1.56 3.4
TDS	79.37-30.62	Telephone and Data Systems	75.13	3.63 5.1
TNI	46.56-12.00	Transnet Network Services	44.38	0.81 1.9
USW	66.00-49.25	US West	54.13	-0.63 -1.1
VIA	49.62-25.43	Viacom (H)	47.94	3.25 7.3
WCII	64.43-12.50	Winstar Communications Inc.	55.88	3.94 7.6
WCDM	96.75-39.00	MCI Worldcom Inc.	79.19	1.75 2.3

SERVICES UP 0.1%

ACXM	31.25-16.12	Axiom Corp. (L)	16.81	1.00 -5.6
ACS	53.00-22.37	Affiliated Computer Servs	40.38	-1.56 -3.7
AMSY	40.25-19.25	American Mgt. Systems	26.13	-1.75 -8.3
AUD	46.87-32.68	Automatic Data Processing	42.31	2.00 5.0
8SYS	60.87-35.37	Bisys Group Inc.	46.75	-0.19 -0.4
CATP	32.25-10.62	Cambridge Technology Ptnrs	15.50	0.50 3.3
CEN	40.50-24.00	Ceridian	26.00	-0.63 -2.3
CBR	31.18-13.31	Ciber Inc.	18.38	-0.63 -3.3
CDD	30.87-10.75	Comdisco	21.50	-0.83 -2.8
CHKZ	31.00-9.25	Computer Horizons Corp	14.00	0.88 6.7
CSC	74.87-46.25	Computer Sciences	65.94	-2.63 -3.8
DST	70.25-34.00	Dsl Systems Inc.	64.19	-2.56 -3.8
EDS	67.37-30.43	Electronic Data Systems	60.81	3.25 5.6
FDC	51.50-19.68	First Data Group	46.75	2.13 4.8
FISV	40.75-24.87	Fiserv	33.00	1.13 3.5
IT	28.12-17.31	Gartner Group	21.25	-0.94 -4.2
KEA	50.12-17.25	Kean	25.75	4.19 19.4
NDC	55.25-26.18	National Data	40.19	0.88 2.2
PAYX	38.75-23.56	Paychex Inc.	30.63	0.69 2.3
PER	85.75-19.18	Perot Systems Corp.	19.75	-0.75 -3.7
REGI	15.06-3.68	Renaissance Worldwide (L)	3.94	-0.75 -16.0
REY	25.31-12.68	Reynolds & Reynolds	21.88	0.69 3.0
SFE	120.00-17.12	Safeguard Scientifics	73.19	5.06 7.4
SAPE	88.13-24.25	Sapient Corp.	88.13	10.38 13.3
SMS	73.50-40.06	Shared Medical Systems	57.31	0.56 1.0
SDS	41.93-21.68	Sungard Data Systems	24.38	-1.75 -6.7
SYNT	24.31-7.00	Syntel Inc.	8.50	-0.38 -4.2
TECD	53.12-14.50	Tech Data	27.38	-3.56 -11.5
TENF	39.50-21.50	TenFold Corp.	30.50	2.00 7.0
TSS	26.25-14.43	Total System Services Inc.	15.44	0.44 2.9
TSAI	51.00-26.00	Transaction Sys. Architects	30.06	0.06 0.2

NETWORK UP 1.9%

COMS	51.12-20.00	3Com Corp.	27.88	1.19 4.4
ADCT	53.62-15.75	ADC Telecommunications Inc.	42.63	2.75 8.9
ANTC	50.43-11.50	Anitec	46.06	0.56 1.2
BNYN	19.37-2.12	Banyan Systems Inc.	6.94	-0.53 -7.1
CS	18.25-7.18	Cabletron Systems (H)	18.06	1.19 7.0
CNEBF	10.28-3.93	Call Net Enterprises	6.00	0.31 5.5
CSCD	71.75-20.56	Cisco Systems Inc. (H)	71.31	1.25 1.8
ECIL	45.00-19.75	ECI Telecom	27.50	0.31 -1.1
ENTU	43.08-9.00	Entrust Technologies Inc.	23.25	1.19 5.4
HRS	40.62-24.44	Harris Corp. (L)	24.44	2.56 9.5
GMH	63.87-30.37	Hughes Electronics/GM	54.63	4.63 9.3

EXCH	52-WEEK RANGE	SEPT. 10 2 PM	WK NET CHANGE	WK PCT CHANGE
SEMICONDUCTORS, CHIPS & EQUIPMENT UP 2.4%				
ERIC	1.5-1.1	Ericsson	1.5	0.9
JNPR	4.43-9	Juniper Networks	4.43	1.74
LU	79.75-24.8	Lucent Networks	6	1.74
MALF	5.19-1.5	Malvern Networks	4.4	1.74
NCDI	9.50-4.3	Network Computer Dev.	5	1.74
NWK	13.68-7.31	Network Equipment	9.5	1.74
NN	39.81-15.43	Network Networks	27.7	1.74
NOK	99.37-29.50	Nokia Corp.	90.8	1.74
NT	47.61-13.37	Northern Telecom Ltd. (H)	4.81	5.38
PAIR	16.12-6.00	Pargam Networks	19	0.11
PCTL	11.00-4.31	PCTel	4.66	6.14
SFA	55.68-1.75	Scientific Atlanta (H)	5.19	1.94
TLAB	74.00-15.68	Teleabs Inc.	60.81	0.75 1.2
USW	68.00-49.25	US West	54.13	0.63 1.1
VRIL	8.37-2.00	VeriLink	2.06	0.9 4.3
WSTL	11.18-2.75	Waste Technology Inc.	8.13	0.81 11.1

SEMICONDUCTORS, CHIPS & EQUIPMENT UP 2.4%

ADPT	42.87-7.87	Adaptec	38.69	-1.06 -2.7
AMD	33.00-9.31	Advanced Micro Devices	22.13	1.06 5.0
ALTR	52.25-14.75	Altera (H)	52.25	3.44 7.0
ADI	58.87-12.00	Analog Devices (H)	56.81	3.56 6.7
AMAT	79.93-21.56	Applied Materials	79.93	2.63 3.4
ASML	69.62-12.93	ASM Lithography Holding	66.13	1.75 2.6
HRS	40.62-24.44	Harris Corp. (L)	24.44	2.56 9.5
INTC	89.50-38.00	Intel Corp. (H)	86.94	1.75 2.0
KLAC	73.06-20.75	Kla Instruments	73.06	5.06 7.4
LLTC	75.75-19.56	Linear Technology	66.25	1.94 2.8
LSI	59.81-10.50	LSI Logic (H)	59.00	0.63 1.1
MXIM	73.50-22.31	Maxim Integrated Products	72.69	2.69 3.8
MU	82.50-23.43	Micron Technology (H)	74.88	-4.25 -5.4
MDT	101.18-38.37	Motorola (H)	98.94	4.69 5.0
NSM	34.94-7.43	National Semiconductor (H)	34.94	4.44 14.5
STM	78.62-17.93	SGS-Thomson Microelectronics	77.25	4.81 6.8
SLR	78.93-20.00	Soliton Corp.	77.06	1.44 1.9
TER	41.50-7.50	Teradyne (H)	40.44	0.44 1.1

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Fraud Crackdown

we police our site and have strict agreements between buyers and sellers, who sign contracts up front," Score said.

Buyers on the site send payment for goods to Crossmarket, which forwards the payment to the seller if all conditions of the sale are met.

Sellers sign legally binding agreements to ship their products to the highest bidder in the condition in which they were advertised.

EBay, by contrast, makes money from listings and doesn't get involved in the actual buying and selling of the 2 million items per day that its 5.6 million users buy and sell.

Policing the site for illegal items or other inappropriate material is left largely to users,

who can post their concerns to the site's community watch bulletin board. EBay spokeswoman Kristin Seuell said that's how the company learned of the kidney. Once it found out, it stopped the auction and suspended the posting privileges of the Florida user who put the kidney up for bid. It also notified the police.

"When we look back, we'll see this incident has helped to educate people in the eBay community about what our policies are, what actions we take and how closely we work with law enforcement," Seuell said. But even after the incidents, eBay has no plans to prescreen listings, she said.

Other Thoughts

Others have very different ideas about the lessons the incidents have taught.

"The lesson to be learned from eBay is that if the [online]

auctioneer is not taking any responsibility, it becomes a free-for-all," said Score.

"The reason this auction got attention is that it was for a human organ. What if it were for bootlegged software or a stolen car? No one would know the difference," he said.

Buyingedge.com Inc., which runs a so-called reverse online auction service through which buyers post orders for goods and sellers bid on the items, uses a combination of business processes and information technology to prevent the sale of illegal items online.

The site provides buyers with formatted electronic order forms for goods in specific categories. An electronic order form for a stereo system might include fields for whether the system contains a CD player or Dolby technology.

"What we're trying to do is not be a free-for-all. We've set

You Can't Always Buy What You Want

A sample of eBay- or user-halted auctions include:

September	eBay removes listings for three babies
August	A Florida teen offers to sell his virginity; high bid was \$4 before auction was pulled
June	200 "pure, uncut pounds of everyone's favorite white drug" (cocaine) are offered for \$2M before they're pulled 18 hours later
May	An oil painting by Vincent Van Gogh sells for \$9M before the deal flops because the painting's authenticity couldn't be verified
April	16 high-tech workers offer to sell themselves ("team of high-priced, professionally trained cybergeeks") for \$3.14M, before they pull the offering themselves
February	eBay bans the sale of guns and ammunition after offerings for missiles, bazookas (\$175), tear gas grenades (\$202), rocket launchers and semi-automatic handguns are reported on the site

parameters. We have pre-designated forms, and there is no form for cocaine, for example," said Jacques Wagemaker, a company spokesman. "If you

went in and tried to buy a body part, there's no way the system would distribute it [to potential sellers] because it's not programmed to do it." ■

Continued from page 1

Microsoft Users Cool to 'PC Plus'

well over \$8 billion in the past four years just on investments in non-PC technology and high-speed and wireless data communications, according to a *Computerworld* study.

Corporate users see Microsoft as an important player in any market it chooses to enter. But Microsoft's desktop dominance guarantees it little in this new world.

In a *Computerworld* survey of 103 information technology managers, Microsoft received a mediocre rating from users regarding how well it is addressing non-PC clients (see chart, page 1).

But Microsoft is stepping up its rhetoric to convince users it is the vendor of choice in that space. In June, Chief Operating Officer Bob Herbold dedicated much of his keynote address at PC Expo to Windows CE. And at a July analyst briefing, Microsoft President Steve Ballmer explained that the company is trying to expand beyond its PC-centric focus to enable other alternative clients.

"While we think PCs will re-

main the central device in some senses of the information revolution, we certainly admit the fact that there are going to be lots of other devices, some terminals, handheld devices, television-based devices, etc.," Ballmer said.

The respect the company has earned from users so far varies, and it isn't commanding. "Microsoft is certainly competing, but it is not leading the pack the way they have in the past [on the desktop]," said Mike Koehler, vice president of technology at Ameriserve Food Distribution Inc., a \$2.4 billion company in Addison, Texas. "The other competitors are on an even playing field [with Microsoft]. The PalmPilot is a good example."

At State Street Bank in Boston, employees can use handheld computers based on either Microsoft's Windows CE operating system or 3Com Corp.'s Palm Computing environment, said George Abbott, IS manager at the bank's cash management division. Abbott said he believes that Microsoft

could eventually come to dominate the handheld market, but the users in his division now use Palm devices because they can take much fuller advantage of Lotus Notes.

The latest Windows CE devices, called Jupiter machines, have taken off slowly [Technology, Aug. 2], although in *Computerworld's* survey, 18% of managers said their organization has at least some Windows CE systems.

Abbott and Koehler said Microsoft's clout means it must be watched closely, but users' patronage isn't assured the way it is on the desktop. The market isn't dominated by Windows, and other choices are at least equally appealing, users said.

In the set-top box market,

Microsoft faces competition from at least three major operating environment vendors that also are on the way to deployment on millions of set-top boxes, said Bill Thomas, senior vice president of product development at TV Guide Networks Inc. in Tulsa, Okla., which develops programming guides for set-top systems.

Some observers view Microsoft's PC heritage as a liability as the vendor tries to assert credibility in a thin-client world. "Microsoft is afraid of jeopardizing their own business model, and that will keep their hands tied," said Neil McDonald, an analyst at Gartner Group Inc. in Stamford, Conn.

Others are concerned about Microsoft's transition from an engineering perspective.

"My concern is that it is an unfamiliar place for them," said Forrest L. Jerome III, director of technology information systems at Colgate-Palmolive Co.'s technology center in Piscataway, N.J. He said Microsoft's familiar ground is large operating systems and applications designed for "fat" systems with lots of memory and storage. "They have not been able to demonstrate skills at optimization," Jerome said.

Still, Microsoft's approach to the market has its share of fans.

Bill Nicholson, IS director at Catellus Development Corp., a nationwide real estate company in San Francisco, said Microsoft has a stronger understanding of client-side computing and the end user than most of its major competitors. Catellus has studied what technology new home buyers will desire, and Nicholson feels Microsoft is well-positioned to address those needs. It just may take Microsoft a little more time to satisfy the marketplace, he added.

"Microsoft has historically proven that they get into something, they do a decent job with it, they get some flack for it, and then they come back and do it right," Nicholson said. ■

Spending Spree

Some of Microsoft's larger non-PC investments include:

AMOUNT	COMPANY/CATEGORY
\$5B	AT&T, set-top boxes (May 1999)
\$1B	Comcast, PC/TV convergence (June 1997)
\$600M	Nextel, wireless Internet (May 1999)
\$500M	NTL, voice/video/data convergence (January 1999)
\$425M	WebTV, Internet on TV (April 1997)



FRANK HAYES/FRANKLY SPEAKING

Sanity check, please

IT HAPPENED AGAIN LAST WEEK: another big-time gaffe at a retailer's Web site. This time it was English catalog company Argos, whose online operation offered 21-in. Sony TV sets for £3 (about \$4.75) instead of the £299.99 they were supposed to go for. It was a simple glitch — a rounding error, a couple zeroes dropped — but nobody at Argos noticed the problem until bargain-happy Britons had ordered more than £1 million worth of TVs.

Now Argos argues it doesn't have to ship the TVs because it never confirmed the orders. Some English legal beagles say not so fast; the company faces possible lawsuits for false advertising. And — far

worse — its reputation now stinks with thousands of teed-off customers.

This kind of blunder could only happen on the Web. Because the Web is the only place where human sanity checks have been stripped out of retailing, replaced by . . . well, *nothing*.

It couldn't happen in an ordinary, low-tech store. Even the dimmest checkout clerk would notice insanely low prices. It couldn't happen by mail order or over the phone, where there are always people in the loop between customers and the order entry system. The first time anyone tried buying a £3 TV, a \$7.99 computer or a \$98 car, the foul-up would be found. Sorry, folks — no sale.

But with database-generated, fully automated Web shopping, who needs salespeople? So one keystroke gone awry can automatically drive a deep-cut discount onto your virtual showroom. And you can easily sell a million dollars of goods before someone spots the problem.

So how to protect against this kind of garbage-in/garbage-out craziness?

Easy — just add a moderately experienced salesperson or two to the Web site's quality control team.

Call them sanity checkers. Every time a change is made to the site — new product, special offer, design change — your low-tech, merchandise-knowledgeable QC person vets it immediately to make sure it's right.

Insane prices, impossible product descriptions and idiotic formatting will pop right out at a sanity checker. So will more subtle things that make your site hard to navigate and use, like cluttered screens or pages that require constant scrolling.

And between changes, a sanity checker can monitor the site, watching for slowdowns, lock-ups and other problems. It just takes one set of sales-trained eyes to make your Web store better on a day-to-day basis — and every now and then save you from truly embarrassing (and potentially very costly) screw-ups.

Simple, right?

So what's the catch? It's this: The very idea of a sanity checker is as politically incorrect as they come.

Adding a sanity checker makes your IT quality-control people look like they're not doing their job. It suggests that the fancy database-driven Web-commerce system isn't as good as you made it sound. It means adding a warm body (and not even a *techie* warm body) to what was supposed to be a fully automated system.

Which is exactly why it's your IT shop — not marketing or upper management or some outside consultant — that should be campaigning for a sanity checker.

Face it, if anyone else starts promoting this idea, it makes IT look bad. Sloppy. Incompetent.

But if the idea comes from you, you can spin it as a shining example of a commerce-savvy IT shop going after what's best for the business, *even if that means a low-tech solution*.

Who says we can't play the game too?

So start pushing for that sanity checker. Or when the next big e-commerce gaffe happens, yours could be the Web site that's gone insane. ▀

Hayes, Computerworld's staff columnist, has covered IT for 20 years. His e-mail address is frank_hayes@computerworld.com.

To avoid Web screw-ups, add a low-tech pair of human eyes.



SHARK TANK

PREMATURE CONGRATULATIONS "Job Done, Social Security's Y2K Leader Is Moving On," fawned the *Computerworld* headline (News, Aug. 23). The fearless leader in question was Kathleen Adams, the Social Security Administration's IT honcho. Whoa, Nellie: Chris, a pilot fish, points out that "Ms. Adams had to wipe the egg off her face after the SSA mailed out 32,000 notices stating that benefits for children would expire in January 1900." Adams dismissed the glitch as "cosmetic." The Shark knows she's right — but that PR sword cuts both ways.

HOW LOW CAN YOU GO? A friend of the Tank was IT manager at a small family operation. Noticed tons of JPEG files in a user directory: "hundreds of pictures of pedophilia and other sexual ad nauseam." The user in question, who'd always seemed pretty decent, claimed ignorance. So our guy went to the COO, who threw a fit and "hounded" the user until he quit. Six months passed. Same thing happened with another user. But our IT guy had grown suspicious and laid traps. You've guessed the rest: The COO was storing his own filthy downloads in employees'

directories. The IT guy could prove it — but had a career to think about. He split.

STILL LAUGHING at "Millennium Pie," a song parody written and copyrighted by Scott McNulty ("with apologies to Don McLean"), who works for CARL Corp. in Denver. Here, with Scott's permission, is the chorus:

So, . . . Bye, bye to the next digit of Pi/Ran my PC on some DC but the voltage was dry/And good ol' boys were sending e-mail replies/Saying this will be the day I retire/This will be the day I retire.

Trust me, the whole thing is this good. To see the rest, check out the Daily Shark online, which will run "Millennium Pie" in its entirety on Tuesday.

Yeah, the Tank is now a daily feature (he said, blushing). You can get fresh IT dirt every morning at computerworld.com/sharky. What's in it for you? From now on, if your submission runs in the Tank, you'll get a cool Shark Shirt (see a picture on page 3). So don't just sit there, shoot me some scandal: sharky@computerworld.com.

The 5th Wave



"So much for the Graffiti handwriting system."

E-mail: Rich Tennant at the5wave@aol.net

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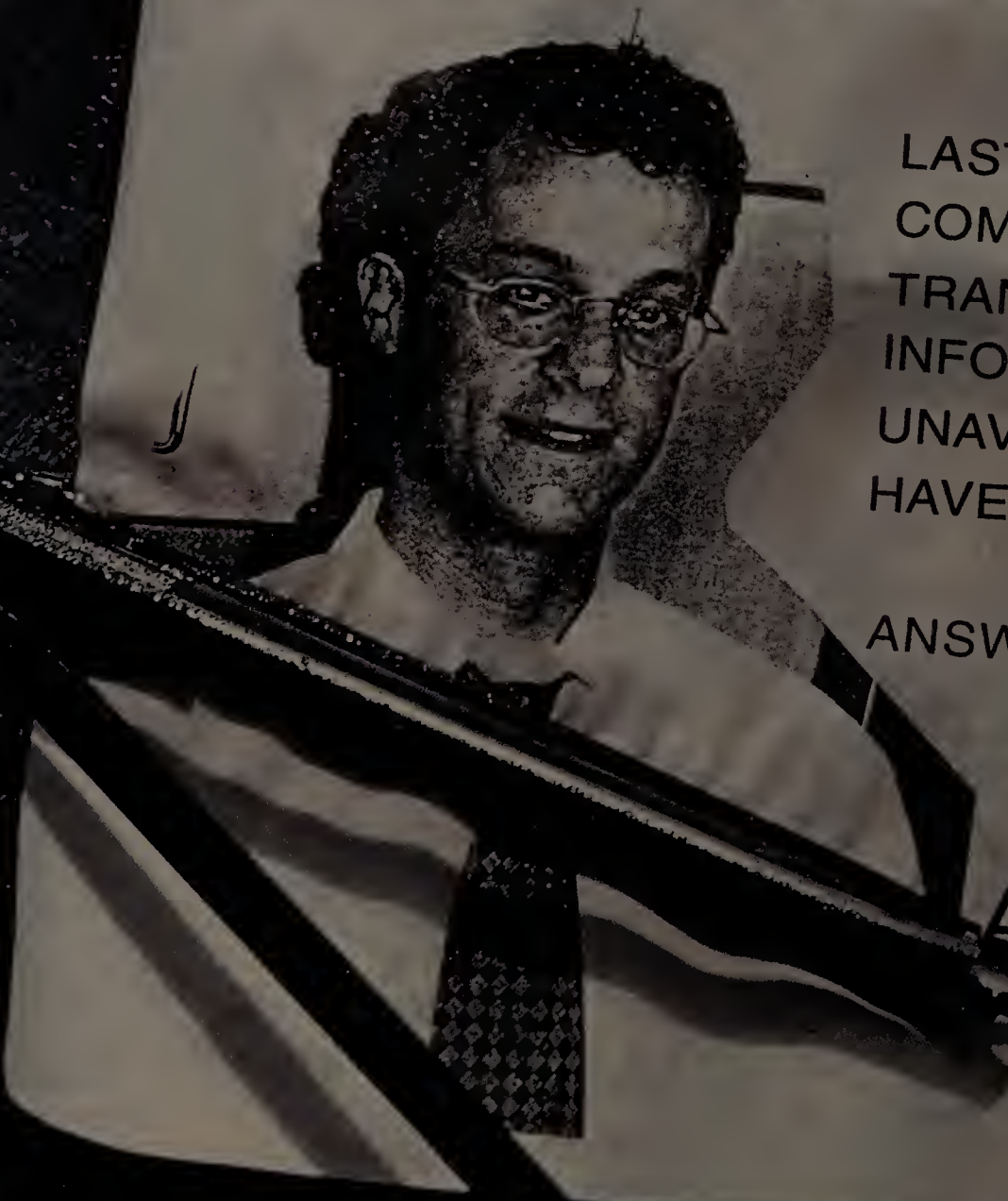
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